

=> FILE REG

FILE 'REGISTRY' ENTERED AT 16:37:58 ON 10 SEP 2003  
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STRUCTURE FILE UPDATES: 9 SEP 2003 HIGHEST RN 582289-61-0  
DICTIONARY FILE UPDATES: 9 SEP 2003 HIGHEST RN 582289-61-0

TSCA INFORMATION NOW CURRENT THROUGH JULY 14, 2003

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. See HELP  
PROPERTIES for more information. See STN Note 27, Searching Properties  
in the CAS Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

=> FILE HCAPLUS

FILE 'HCAPLUS' ENTERED AT 16:38:03 ON 10 SEP 2003  
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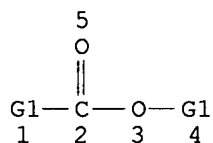
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FILE COVERS 1907 - 10 Sep 2003 VOL 139 ISS 11  
FILE LAST UPDATED: 9 Sep 2003 (20030909/ED)

This file contains CAS Registry Numbers for easy and accurate  
substance identification.

=> D QUE L44

L3 STR ↓



VAR G1=AK/CY

NODE ATTRIBUTES:  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 5

STEREO ATTRIBUTES: NONE  
L4 STR 2

CH-O-G1  
1 2 3

VAR G1=H/AK/CY  
NODE ATTRIBUTES:  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 3

STEREO ATTRIBUTES: NONE  
L5 STR 3

C $\odot$ O $\odot$ C  
1 2 3

NODE ATTRIBUTES:  
NSPEC IS R AT 1  
NSPEC IS R AT 2  
NSPEC IS R AT 3  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 3

STEREO ATTRIBUTES: NONE

L7 SCR 2043  
L9 SCR 1992  
L29 174740 SEA FILE=REGISTRY SSS FUL L3 AND L7 NOT L9  
L31 165563 SEA FILE=REGISTRY SUB=L29 SSS FUL (L4 OR L5)  
L35 22303 SEA FILE=REGISTRY ABB=ON 108-31-6/CRN  
L36 6619 SEA FILE=REGISTRY ABB=ON L31 AND L35  
L37 158944 SEA FILE=REGISTRY ABB=ON L31 NOT L36  
L38 37454 SEA FILE=REGISTRY ABB=ON L37 AND 2/NC  
L42 411 SEA FILE=HCAPLUS ABB=ON L38(L) (PREP OR IMF OR SPN)/RL(L) PHOTOR  
ESIST?  
L43 40 SEA FILE=HCAPLUS ABB=ON L42(L) PATTERN?  
L44 40 SEA FILE=HCAPLUS ABB=ON L42 AND L43

=> D L44 ALL 1-40 HITSTR

L44 ANSWER 1 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

KATHLEEN FULLER EIC 1700/PARKER LAW 308-4290

*165,563 polymers  
from structure 1 and (2 or 3)*

AN 2003:371832 HCAPLUS  
 DN 138:376420  
 TI Chemically amplified positive photoresists for micropatterns with  
 minimized edge roughness  
 IN Kodama, Kunihiro  
 PA Fuji Photo Film Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 60 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM G03F007-039  
 ICS G03F007-004; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003140344	A2	20030514	JP 2001-337884	20011102
PRAI	JP 2001-337884		20011102		
OS	MARPAT 138:376420				
AB	The photoresists, having excellent transparency to .ltoreq.250-nm light and generating less scums, contain (A) sulfonium salts bearing OH groups at cation parts and generating acids upon radiation and (B) acid-labile alicyclic hydrocarbons. The photoresists may contain basic compds. (e.g., imidazoles, diazabicyclo compds., etc.), F- or silicone-type surfactants, and acid-labile dissoln. inhibitors of mol. wt. .ltoreq.3000.				
ST	photoresist hydroxy substituted sulfonium acid generator; scum reduced amplified photoresist edge roughness; DBU surfactant photoresist far UV transparency				
IT	Surfactants (amplified pos. photoresists contg. hydroxy-substituted sulfonium salts and forming patterns with minimized edge roughness)				
IT	Positive photoresists (chem. amplified; amplified pos. photoresists contg. hydroxy-substituted sulfonium salts and forming patterns with minimized edge roughness)				
IT	Sulfonium compounds RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses) (hydroxy-contg., radiation-sensitive acid generators; amplified pos. photoresists contg. hydroxy-substituted sulfonium salts and forming patterns with minimized edge roughness)				
IT	Catalysts (photochem., acid generators; amplified pos. photoresists contg. hydroxy-substituted sulfonium salts and forming patterns with minimized edge roughness)				
IT	Polysiloxanes, uses RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses) (surfactants; amplified pos. photoresists contg. hydroxy-substituted sulfonium salts and forming patterns with minimized edge roughness)				
IT	240424-21-9P 524699-48-7P RL: CAT (Catalyst use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (acid generators; amplified pos. photoresists contg. hydroxy-substituted sulfonium salts and forming patterns with minimized edge roughness)				

IT 279218-75-6 478837-88-6 508182-59-0 524699-49-8 524699-50-1  
 524699-51-2 524699-53-4 524699-55-6 524699-56-7 524699-57-8  
 524699-58-9 524699-59-0 524699-60-3 524699-61-4  
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES  
 (Uses)  
 (acid generators; amplified pos. photoresists contg.  
 hydroxy-substituted sulfonium salts and forming patterns with minimized  
 edge roughness)

IT **250378-10-0P**, Butyrolactone methacrylate-2-ethyl-2-adamantyl  
 methacrylate copolymer 391232-36-3P 398140-57-3P  
 RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered  
 material use); **PREP (Preparation)**; USES (Uses)  
 (amplified pos. **photoresists** contg. hydroxy-substituted  
 sulfonium salts and forming **patterns** with minimized edge  
 roughness)

IT 484-47-9, 2,4,5-Triphenylimidazole 621-77-2, Tripentylamine 1116-76-3,  
 Tri-n-octylamine 2052-49-5, Tetrabutylammonium hydroxide 3001-72-7,  
 1,5-Diazabicyclo[4.3.0]non-5-ene 3040-44-6, 1-Piperidineethanol  
 19293-63-1, Dicyclohexylmethylamine 19600-49-8, Triphenylsulfonium  
 acetate 24544-04-5, 2,6-Diisopropylaniline 70384-51-9 137462-24-9,  
 Megafac F 176 216679-67-3, Megafac R 08  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material  
 use); USES (Uses)  
 (amplified pos. photoresists contg. hydroxy-substituted sulfonium salts  
 and forming patterns with minimized edge roughness)

IT 288303-55-9 391613-77-7 398140-36-8 398140-38-0 398140-40-4  
 398140-43-7 398140-45-9 398140-47-1 398140-48-2 398140-50-6  
 398140-52-8 398140-59-5 398140-60-8 398140-62-0 398140-64-2  
 398140-65-3 398140-68-6 398140-69-7 398140-71-1 398140-72-2  
 398140-73-3 398140-74-4 398140-76-6 398140-77-7 398140-78-8  
 398140-79-9 398140-80-2 405509-18-4 405509-19-5 405509-25-3  
 482609-97-2 508210-04-6 515876-73-0 521303-15-1 521303-16-2  
 524699-47-6  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (amplified pos. photoresists contg. hydroxy-substituted sulfonium salts  
 and forming patterns with minimized edge roughness)

IT 75-75-2, Methanesulfonic acid 576-26-1, 2,6-Xylenol 945-51-7, Diphenyl  
 sulfoxide 25601-74-5, 3,5-Bis(trifluoromethyl)benzenesulfonic acid  
 29420-49-3, Potassium nonafluorobutanesulfonate 328935-87-1  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reactants for acid generators; amplified pos. photoresists contg.  
 hydroxy-substituted sulfonium salts and forming patterns with minimized  
 edge roughness)

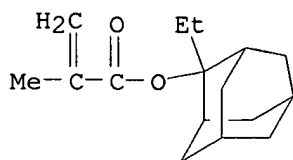
IT **250378-10-0P**, Butyrolactone methacrylate-2-ethyl-2-adamantyl  
 methacrylate copolymer  
 RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered  
 material use); **PREP (Preparation)**; USES (Uses)  
 (amplified pos. **photoresists** contg. hydroxy-substituted  
 sulfonium salts and forming **patterns** with minimized edge  
 roughness)

RN 250378-10-0 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
 polymer with tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA  
 INDEX NAME)

CM 1

CRN 209982-56-9

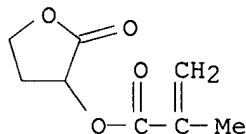
CMF C16 H24 O2



CM 2

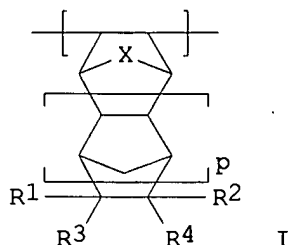
CRN 195000-66-9

CMF C8 H10 O4



L44 ANSWER 2 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:353741 HCAPLUS  
 DN 138:376396  
 TI Chemically amplified positive photoresists suppressing pattern shrinking  
 for ArF excimer laser lithography  
 IN Hashimoto, Kazuhiko; Uetani, Yasunori; Fujishima, Hiroaki; Yoshida, Isao  
 PA Sumitomo Chemical Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 12 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM G03F007-039  
 ICS G03F007-004; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 38  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003131381	A2	20030509	JP 2001-302904	20010928
PRAI	JP 2001-243895	A	20010810		
GI					



AB The photoresists contain alkali-insol. polymers which contain unit I [X = O, S, (m)ethylene; R1, R2 = H, C1-12 alkyl, acid-labile group; R3, R4 = H, C1-12 alkyl, acid-labile group, R5CO2R' (R5 = direct bond, C1-12 alkylene; R' = H, C1-12 alkyl, acid-labile group), or alkyl-, lactone-, anhydride-, or ether-bearing ring; p = 0-2] and become sol. in aq. alkalis upon acid action. The polymers, which can be prep'd. without metal-based catalysts, show little shrinkage upon exposure to electron beams in SEM observation.

ST amplified photoresist SEM observation pattern stability; fluoride laser transparent amplified etching photoresist; alicyclic acrylic polymer amplified pos photoresist

IT Positive photoresists  
(chem. amplified; chem. amplified pos. photoresists contg. alicyclic group-contg. polymers and causing no pattern shrinking in SEM observation)

IT **521096-22-0P**, exo-3,6-Epoxy-1,2,3,6-tetrahydrophthalic anhydride-2-methyl-2-adamantyl 5-norbornene-2-carboxylate copolymer  
**521096-24-2P 521096-26-4P 521096-27-5P**  
**521096-28-6P 521096-29-7P 521096-30-0P**  
RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(chem. amplified pos. **photoresists** contg. alicyclic group-contg. polymers and causing no **pattern** shrinking in SEM observation)

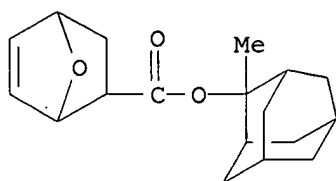
IT **521096-22-0P**, exo-3,6-Epoxy-1,2,3,6-tetrahydrophthalic anhydride-2-methyl-2-adamantyl 5-norbornene-2-carboxylate copolymer  
**521096-24-2P 521096-26-4P 521096-27-5P**  
**521096-29-7P**  
RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(chem. amplified pos. **photoresists** contg. alicyclic group-contg. polymers and causing no **pattern** shrinking in SEM observation)

RN **521096-22-0 HCAPLUS**

CN 7-Oxabicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with rel-(3aR,4S,7R,7aS)-hexahydro-4,7-epoxyisobenzofuran-1,3-dione (9CI) (CA INDEX NAME)

CM 1

CRN 521096-21-9  
CMF C18 H24 O3

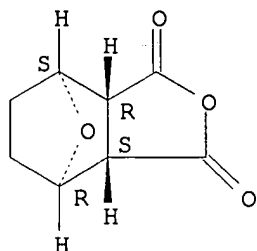


CM 2

CRN 29745-04-8

CMF C8 H8 O4

Relative stereochemistry.



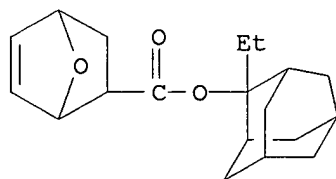
RN 521096-24-2 HCAPLUS

CN 7-Oxabicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-ethyltricyclo[3.3.1.1.3,7]dec-2-yl ester, polymer with rel-(3aR,4S,7R,7aS)-hexahydro-4,7-epoxyisobenzofuran-1,3-dione (9CI) (CA INDEX NAME)

CM 1

CRN 521096-23-1

CMF C19 H26 O3

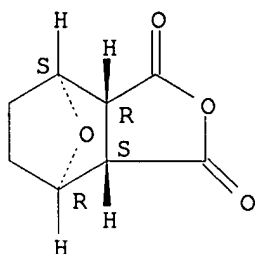


CM 2

CRN 29745-04-8

CMF C8 H8 O4

Relative stereochemistry.



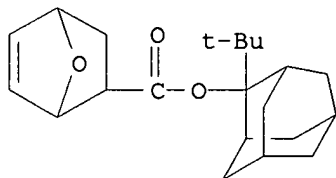
RN 521096-26-4 HCAPLUS

CN 7-Oxabicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-(1,1-dimethylethyl)tricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with rel-(3aR,4S,7R,7aS)-hexahydro-4,7-epoxyisobenzofuran-1,3-dione (9CI) (CA INDEX NAME)

CM 1

CRN 521096-25-3

CMF C21 H30 O3

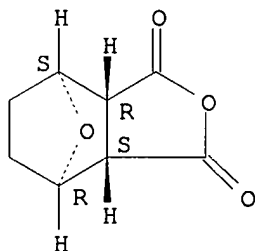


CM 2

CRN 29745-04-8

CMF C8 H8 O4

Relative stereochemistry.



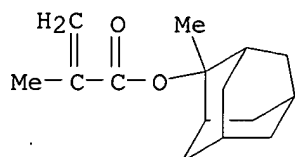
RN 521096-27-5 HCAPLUS

CN 7-Oxabicyclo[2.2.1]hept-5-ene-2-carboxylic acid, polymer with 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

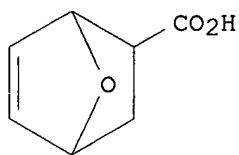


CRN 177080-67-0  
CMF C15 H22 O2



CM 2

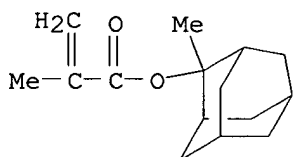
CRN 24363-23-3  
CMF C7 H8 O3



RN 521096-29-7 HCAPLUS  
CN 7-Oxabicyclo[2.2.1]hept-5-ene-2-carboxylic acid, methyl ester, polymer  
with 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl 2-methyl-2-propenoate (9CI) (CA  
INDEX NAME)

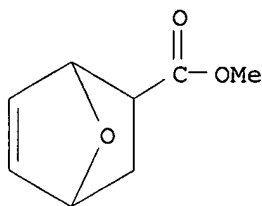
CM 1

CRN 177080-67-0  
CMF C15 H22 O2



CM 2

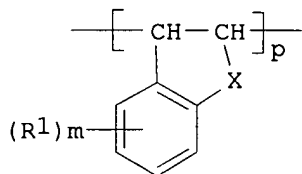
CRN 21987-33-7  
CMF C8 H10 O3



L44 ANSWER 3 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:217340 HCAPLUS  
 DN 138:262684  
 TI Chemically amplified photoresist composition containing specific resin and method for pattern formation using the same  
 IN Hatakeyama, Jun; Takeda, Takanobu; Watanabe, Osamu; Hasegawa, Koji  
 PA Shin-Etsu Chemical Industry Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 32 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM G03F007-039  
 ICS C08F212-04; C08F220-10; C08F220-42; C08F222-10; C08F232-08; C08F234-00; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 35

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003084440	A2	20030319	JP 2002-22638	20020131
PRAI	JP 2001-204623	A	20010705		
GI					

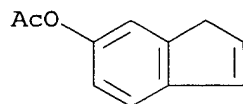


AB The title compn. contains a resin and a photoacid generator, wherein the resin has repeating unit I (R1 = H, OH, C1-4 alkyl, C1-20 alkoxy, halo; m = 0, 1-4 integer; X = O, S, -NR-; R = H, C1-4 alkyl, OH; p = pos. no.). The compn. provides the photoresists of high sensitivity and high resolu. and is suitable for manufg. super LSI.  
 ST photoresist compn resin  
 IT Photoresists  
 (photoresist compn. contg. specific resin and method for pattern formation using the same)  
 IT 161453-44-7 193345-23-2 266308-64-9  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (acid generator; photoresist compn. contg. specific resin and method for pattern formation using the same)

IT 502183-74-6DP, hydrolyzed 502183-76-8DP, hydrolyzed 502183-77-9DP, hydrolyzed 502183-78-ODP, hydrolyzed 502183-78-ODP, hydrolyzed and ethoxyethylated **502183-79-1DP**, hydrolyzed **502183-79-1DP**, hydrolyzed and ethoxyethylated 502183-80-4DP, hydrolyzed 502183-80-4DP, hydrolyzed and ethoxyethylated  
 RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
 (photoresist compn. contg. specific resin and method for **pattern** formation using the same)  
 IT 502183-73-5DP, hydrolyzed 502183-75-7DP, hydrolyzed  
 RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
 (resin; photoresist compn. contg. specific resin and method for pattern formation using the same)  
 IT **502183-79-1DP**, hydrolyzed  
 RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
 (photoresist compn. contg. specific resin and method for **pattern** formation using the same)  
 RN 502183-79-1 HCAPLUS  
 CN 6-Benzofuranol, acetate, polymer with 1H-inden-6-yl acetate (9CI) (CA INDEX NAME)

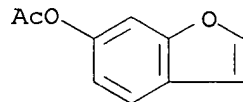
CM 1

CRN 489439-24-9  
 CMF C11 H10 O2



CM 2

CRN 408312-41-4  
 CMF C10 H8 O3



L44 ANSWER 4 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:71242 HCAPLUS  
 DN 138:129010  
 TI Norbornene-based polymers, resist materials, and pattern formation  
 IN Nishi, Tsunehiro; Nakajima, Atsuo; Watanabe, Takeshi  
 PA Shin-Etsu Chemical Industry Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 37 pp.  
 CODEN: JKXXAF  
 DT Patent

LA Japanese

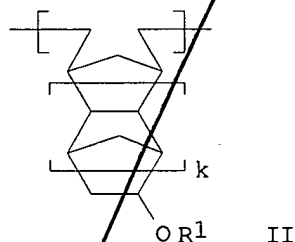
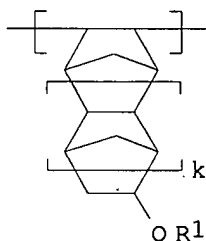
IC ICM C08F032-00

ICS C08G061-08; G03F007-039; H01L021-027

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003026728	A2	20030129	JP 2001-213194	20010713
PRAI	JP 2001-213194		20010713		
GI					



AB The polymers with wt. -av. mol. wt. 1000-500,000 have norbornene-based structural repeating units I or II (R1 = H, C1-15 normal, branched, or cyclic alkyl or acyl, C2-15 normal, branched, or cyclic hydroxyalkyl, alkoxyalkyl, or alkoxyacetyl; R1 may be substituted by halogen; k = 0, 1). Patterns are formed by applying resist materials contg. the polymers on substrates, heating, exposing to high-energy beam or electron beam via photomasks, heating optionally, and developing. The resist materials show high resolu. and good etching resistance.

ST norbornene polymer photoresist resolu improvement; patterning norbornene polymer photoresist etching resistance

IT Photoresists

(norbornene-based polymers with good etching resistance as photoresists for pattern formation)

IT 490040-67-0P 490040-69-2P 490040-70-5P 490040-72-7P 490040-73-8P  
490040-74-9P **490040-76-1P** 490040-77-2P 490040-78-3P

RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(norbornene-based polymers with good etching resistance as **photoresists** for pattern formation)

IT **490040-76-1P**

RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(norbornene-based polymers with good etching resistance as **photoresists** for pattern formation)

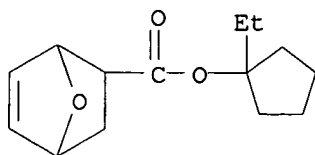
RN 490040-76-1 HCAPLUS

CN 7-Oxabicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-ethylcyclopentyl ester, polymer with 1,2,3,4,4a,5,8,8a-octahydro-1,4:5,8-dimethanonaphthalen-2-yl acetate (9CI) (CA INDEX NAME)

CM 1

CRN 368872-81-5

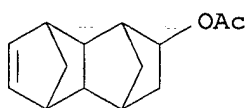
CMF C14 H20 O3



CM 2

CRN 3439-94-9

CMF C14 H18 O2



L44 ANSWER 5 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:58829 HCAPLUS  
 DN 138:107615  
 TI Reflection-inhibiting resin composition used in process for forming  
 photoresist pattern  
 IN Hong, Sung Eun; Jung, Min Ho; Kim, Hyeong Soo; Jung, Jae Chang; Baik, Ki  
 Ho  
 PA Hynix Semiconductor Inc., S. Korea  
 SO U.S. Pat. Appl. Publ., 16 pp., Cont.-in-part of U.S. Ser. No. 627,713.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM C08F004-04  
 NCL 526219000; 526273000; 526346000; 524228000; 524268000; 524310000;  
 524315000; 525182000; 525186000  
 CC 37-3 (Plastics Manufacture and Processing)  
 Section cross-reference(s): 74  
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003018150	A1	20030123	US 2002-189056	20020703
PRAI	KR 1999-31300	A	19990730		
	US 2000-627713	A2	20000728		

AB A compn. for reducing the light reflection in a photoresist pattern formation comprises (a)  $[\text{CH}_2\text{CR}_1(\text{CO}_2\text{G})]_x(\text{CH}_2\text{CR}_2\text{R}_3)_y$  (G = glycidyl; R<sub>1</sub>, R<sub>2</sub> = H, OH, CH<sub>2</sub>OH, alkyl; R<sub>3</sub> = substituted aryl groups; x and y represent the relative amts. of each monomer, wherein the mole ratio of x:y is 0.0 - 0.9:0.1 - 1.0), (b) a thermal acid generator, (c) an org. solvent, and optionally (d) a polymer having hydroxyl group as a functional group. The present invention also provides methods for using the above described resin to inhibit reflection of light from the lower layer of a wafer substrate during a photoresist pattern formation process. A compn. contained glycidyl methacrylate- $\alpha$ -methylstyrene copolymer, polyvinylphenol, and a photoacid generator in propylene glycol Me ether

acetate solvent.

ST photoresist reflection inhibiting resin

IT Photoresists

(reflection-inhibiting resin compn. used in process for forming photoresist pattern)

IT 106-91-2P, Glycidyl methacrylate 113538-80-0P 331622-73-2P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(monomer; reflection-inhibiting resin compn. used in process for forming photoresist pattern)

IT 99835-44-6 335157-24-9 348594-74-1 348594-76-3

RL: TEM (Technical or engineered material use); USES (Uses)

(photoacid generator; reflection-inhibiting resin compn. used in process for forming photoresist pattern)

IT 86249-18-5P, Glycidyl methacrylate-.alpha.-methylstyrene copolymer

189117-83-7P 260369-03-7P 331622-76-5P

331622-77-6P 375395-27-0P 488722-36-7P

RL: IMF (Industrial manufacture); POF (Polymer in formulation);

TEM (Technical or engineered material use); PREP (Preparation);

USES (Uses)

(reflection-inhibiting resin compn. used in process for forming photoresist pattern)

IT 59269-51-1, Polyvinyl phenol

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)

(reflection-inhibiting resin compn. used in process for forming photoresist pattern)

IT 79-41-4, Methacrylic acid, reactions 106-89-8, Epichlorohydrin, reactions 556-52-5, Glycidol 814-68-6, Acryloyl chloride 1592-20-7,

4-Vinylbenzyl chloride 27955-94-8, 1,1,1-Tris(4-hydroxy phenyl)ethane

RL: RCT (Reactant); RACT (Reactant or reagent)

(reflection-inhibiting resin compn. used in process for forming photoresist pattern)

IT 86249-18-5P, Glycidyl methacrylate-.alpha.-methylstyrene copolymer

260369-03-7P 331622-76-5P 331622-77-6P

488722-36-7P

RL: IMF (Industrial manufacture); POF (Polymer in formulation);

TEM (Technical or engineered material use); PREP (Preparation);

USES (Uses)

(reflection-inhibiting resin compn. used in process for forming photoresist pattern)

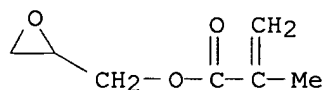
RN 86249-18-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with (1-methylethenyl)benzene (9CI) (CA INDEX NAME)

CM 1

CRN 106-91-2

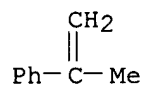
CMF C7 H10 O3



CM 2

CRN 98-83-9

CMF C9 H10



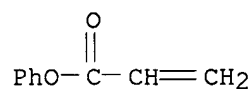
RN 260369-03-7 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with phenyl  
2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 937-41-7

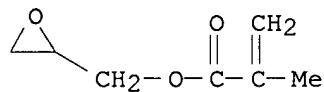
CMF C9 H8 O2



CM 2

CRN 106-91-2

CMF C7 H10 O3



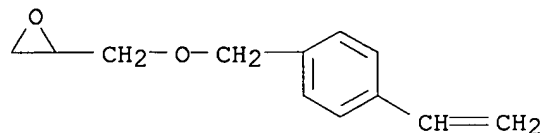
RN 331622-76-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with  
[[ (4-ethenylphenyl)methoxy]methyl]oxirane. (9CI) (CA INDEX NAME)

CM 1

CRN 113538-80-0

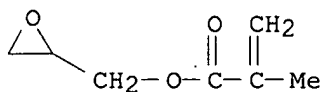
CMF C12 H14 O2



CM 2

CRN 106-91-2

CMF C7 H10 O3



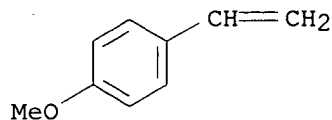
RN 331622-77-6 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with  
1-ethenyl-4-methoxybenzene (9CI) (CA INDEX NAME)

CM 1

CRN 637-69-4

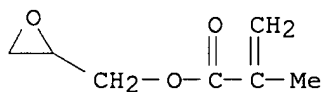
CMF C9 H10 O



CM 2

CRN 106-91-2

CMF C7 H10 O3



RN 488722-36-7 HCAPLUS

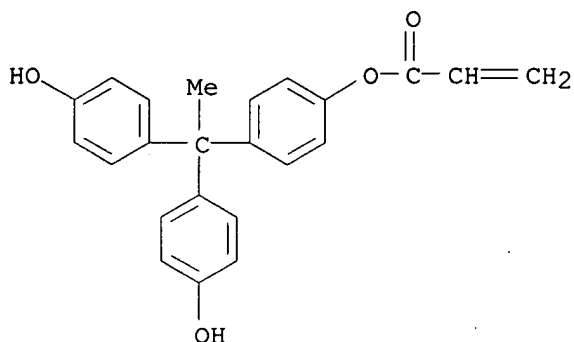
CN 2-Propenoic acid, 4-[1,1-bis(4-hydroxyphenyl)ethyl]phenyl ester, polymer  
with oxiranylmethyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 331622-73-2

CMF C23 H20 O4

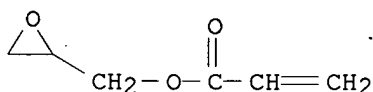




CM 2

CRN 106-90-1

CMF C6 H8 O3



L44 ANSWER 6 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:42890 HCAPLUS  
 DN 138:115058  
 TI Resist composition and patterning process  
 IN Kobayashi, Tomohiro; Nishi, Tsunehiro; Watanabe, Satoshi; Kinsho, Takeshi;  
 Nagura, Shigehiro; Ishihara, Toshinobu  
 PA Shin-Etsu Chemical Co., Ltd., USA  
 SO U.S. Pat. Appl. Publ., 35 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM G03F007-038  
 NCL 430270100; 430296000; 430330000; 430325000  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 35, 38  
 FAN.CNT 1  

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003013039	A1	20030116	US 2002-170345	20020614
	JP 2003066612	A2	20030305	JP 2002-168143	20020610
PRAI	JP 2001-181079	A	20010615		

AB The present invention relates to a resist compn. comprising a hydrogenated  
 product of ring-opening metathesis polymer and a poly(meth)acrylic acid  
 deriv. as a base resin. The present invention relates to a resist compn.  
 is sensitive to high-energy radiation, has excellent sensitivity, resolu.,  
 and etch resistance, and lends itself to micropatterning with electron  
 beams or deep-UV.  
 ST photoresist compn patterning photolithog  
 IT Photolithography

## Photoresists

(photoresist compn. and patterning process)

IT 195000-69-2P 368872-75-7P 479075-48-4P  
 485391-25-1P 485818-87-9P 485818-88-0P 485818-89-1P  
 485818-91-5P 485818-93-7P 485818-94-8P 485818-95-9P  
 485818-96-0P 485818-97-1P 485818-98-2P  
 485818-99-3P 485819-00-9P 485819-01-0P  
 485819-02-1P 485819-04-3P 485819-05-4P 485819-08-7P  
 485819-09-8P 485819-10-1P

RL: PRP (Properties); SPN (Synthetic preparation); TEM  
 (Technical or engineered material use); PREP (Preparation); USES  
 (Uses)

(photoresist compn. and patterning process contg.)

IT 195000-69-2P 368872-75-7P 479075-48-4P  
 485818-87-9P 485818-88-0P 485818-96-0P  
 485818-98-2P 485818-99-3P 485819-00-9P  
 485819-01-0P 485819-02-1P 485819-04-3P  
 RL: PRP (Properties); SPN (Synthetic preparation); TEM  
 (Technical or engineered material use); PREP (Preparation); USES  
 (Uses)

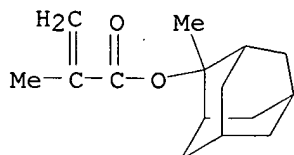
(photoresist compn. and patterning process contg.)

RN 195000-69-2 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
 polymer with tetrahydro-5-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA  
 INDEX NAME)

CM 1

CRN 177080-67-0

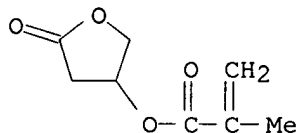
CMF C15 H22 O2



CM 2

CRN 130224-95-2

CMF C8 H10 O4



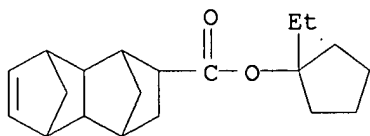
RN 368872-75-7 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-  
 octahydro-, 1-ethylcyclopentyl ester, polymer with 3a,4,7,7a-tetrahydro-  
 4,7-epoxyisobenzofuran-1(3H)-one (9CI) (CA INDEX NAME)

CM 1

CRN 279243-82-2

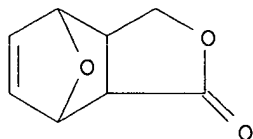
CMF C20 H28 O2



CM 2

CRN 72150-22-2

CMF C8 H8 O3



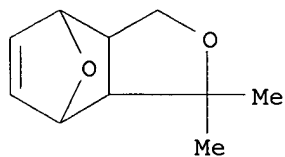
RN 479075-48-4 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-, 1-ethylcyclopentyl ester, polymer with 1,3,3a,4,7,7a-hexahydro-1,1-dimethyl-4,7-epoxyisobenzofuran (9CI) (CA INDEX NAME)

CM 1

CRN 479075-38-2

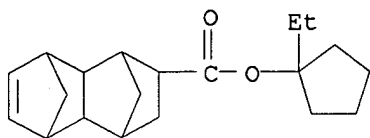
CMF C10 H14 O2



CM 2

CRN 279243-82-2

CMF C20 H28 O2



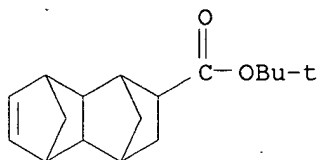
RN 485818-87-9 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-, 1,1-dimethylethyl ester, polymer with 3a,4,7,7a-tetrahydro-4,7-epoxyisobenzofuran-1(3H)-one (9CI) (CA INDEX NAME)

CM 1

CRN 195057-79-5

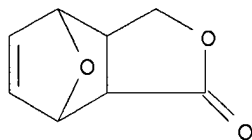
CMF C17 H24 O2



CM 2

CRN 72150-22-2

CMF C8 H8 O3



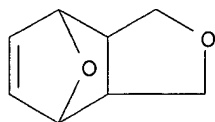
RN 485818-88-0 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-, 1-ethylcyclopentyl ester, polymer with 1,3,3a,4,7,7a-hexahydro-4,7-epoxyisobenzofuran (9CI) (CA INDEX NAME)

CM 1

CRN 479075-40-6

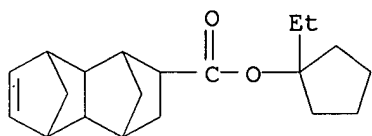
CMF C8 H10 O2



CM 2

CRN 279243-82-2

CMF C20 H28 O2



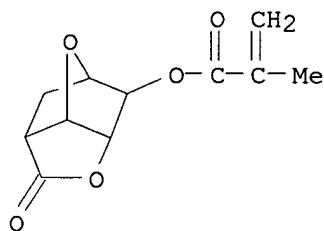
RN 485818-96-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, hexahydro-5-oxo-2,6-methanofuro[3,2-b]furan-3-yl ester, polymer with 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 274248-05-4

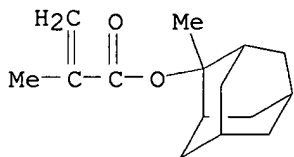
CMF C11 H12 O5



CM 2

CRN 177080-67-0

CMF C15 H22 O2



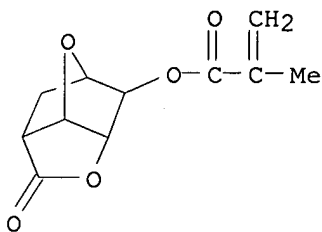
RN 485818-98-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-ethylcyclopentyl ester, polymer with hexahydro-5-oxo-2,6-methanofuro[3,2-b]furan-3-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 274248-05-4

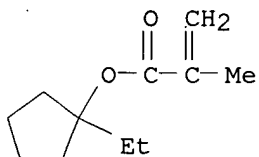
CMF C11 H12 O5



CM 2

CRN 266308-58-1

CMF C11 H18 O2



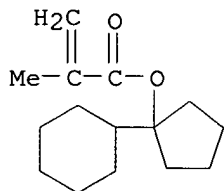
RN 485818-99-3 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-cyclohexylcyclopentyl ester, polymer with  
hexahydro-5-oxo-2,6-methanofuro[3,2-b]furan-3-yl 2-methyl-2-propenoate  
(9CI) (CA INDEX NAME)

CM 1

CRN 366808-98-2

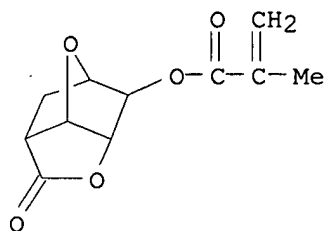
CMF C15 H24 O2



CM 2

CRN 274248-05-4

CMF C11 H12 O5



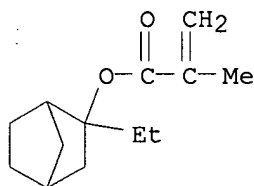
RN 485819-00-9 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethylbicyclo[2.2.1]hept-2-yl ester, polymer with hexahydro-5-oxo-2,6-methanofuro[3,2-b]furan-3-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 330595-98-7

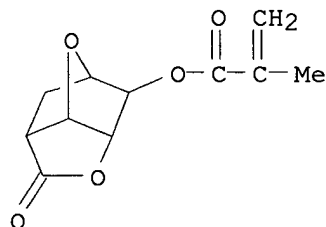
CMF C13 H20 O2



CM 2

CRN 274248-05-4

CMF C11 H12 O5



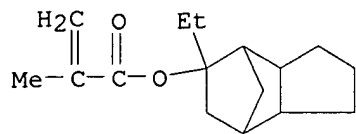
RN 485819-01-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 5-ethyloctahydro-4,7-methano-1H-inden-5-yl ester, polymer with hexahydro-5-oxo-2,6-methanofuro[3,2-b]furan-3-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 348089-09-8

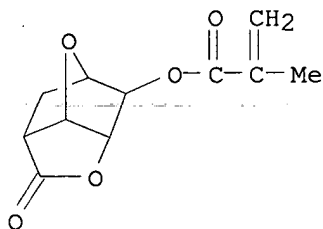
CMF C16 H24 O2



CM 2

CRN 274248-05-4

CMF C11 H12 O5



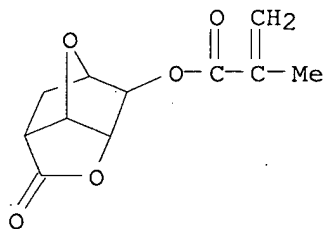
RN 485819-02-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.13,7]dec-2-yl ester,  
polymer with hexahydro-5-oxo-2,6-methanofuro[3,2-b]furan-3-yl  
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 274248-05-4

CMF C11 H12 O5

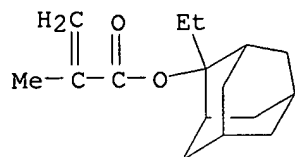


CM 2

CRN 209982-56-9

CMF C16 H24 O2





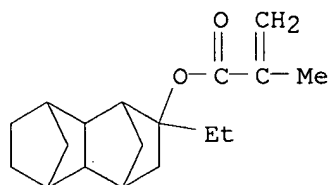
RN 485819-04-3 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyldecahydro-1,4:5,8-dimethanonaphthalen-2-yl ester, polymer with hexahydro-5-oxo-2,6-methanofuro[3,2-b]furan-3-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 485819-03-2

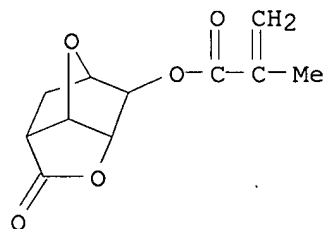
CMF C18 H26 O2



CM 2

CRN 274248-05-4

CMF C11 H12 O5



L44 ANSWER 7 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:978379 HCAPLUS

DN 138:63824

TI Polymers, resist compositions and patterning process, novel tetrahydrofuran compounds and their preparation

IN Nishi, Tsunehiro; Kinsho, Takeshi; Tachibana, Seiichiro; Watanabe, Takeru; Hasegawa, Koji; Kobayashi, Tomohiro

PA Shin-Etsu Chemical Co., Ltd., Japan

SO U.S. Pat. Appl. Publ., 40 pp.

CODEN: USXXCO

DT Patent

KATHLEEN FULLER EIC 1700/PARKER LAW 308-4290

LA English

IC ICM G03F007-038

ICS C08G065-34; G03F007-38; G03F007-40

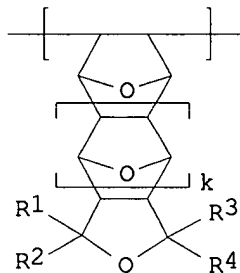
NCL 430270100; 528425000; 528271000; 525088000; 525165000; 430296000;  
430330000; 430311000CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
Reprographic Processes)

Section cross-reference(s): 35, 38

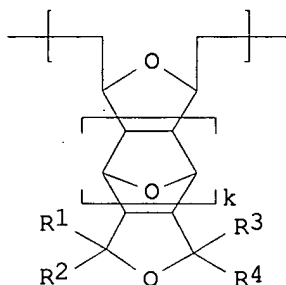
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002197559	A1	20021226	US 2002-126877	20020422
	JP 2003034706	A2	20030207	JP 2002-113252	20020416
PRAI	JP 2001-124126	A	20010423		
	JP 2001-124137	A	20010423		

GI



I



II

AB A polymer comprises recurring units of formula I or II (R1-4 = H, alkyl; or R1,2, and R3,4 taken together may form a ring with each pair being alkylene; k = 0, 1) and having a Mw of 1,000-500,000. A resist compn. comprising the polymer as a base resin is sensitive to high-energy radiation, has excellent sensitivity, resoln., etching resistance, and minimized swell and lends itself to micropatterning with electron beams or deep-UV.

ST photoresist compn patterning THF compd synthesis

IT Photoresists

(photoresist compns. and patterning process contg. novel THF polymer)

IT 479075-39-3P 479075-41-7P 479075-42-8P 479075-44-0P 479075-45-1P

**479075-46-2P 479075-47-3P 479075-48-4P**RL: PRP (Properties); **SPN (Synthetic preparation)**; TEM(Technical or engineered material use); **PREP (Preparation)**; USES

(Uses)

(photoresist compns. and patterning process contg.

novel THF polymer)

IT 470722-61-3P 479075-38-2P 479075-40-6P

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

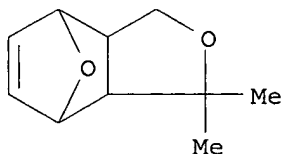
(prepn. of novel THF compd. for photoresist compns. and patterning process)

IT 98-59-9, p-Toluenesulfonyl chloride 72081-09-5 115888-24-9  
479075-51-9

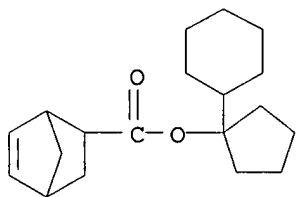
RL: RCT (Reactant); RACT (Reactant or reagent)

(prepn. of novel THF compd. for photoresist compns. and patterning process)

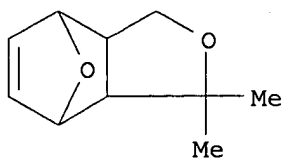
process)  
IT 479075-49-5P 479075-50-8P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(prepn. of novel THF compd. for photoresist compns. and patterning  
process)  
IT 479075-46-2P 479075-48-4P  
RL: PRP (Properties); SPN (Synthetic preparation); TEM  
(Technical or engineered material use); PREP (Preparation); USES  
(Uses)  
(photoresist compns. and patterning process contg.  
novel THF polymer)  
RN 479075-46-2 HCAPLUS  
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-cyclohexylcyclopentyl ester,  
polymer with 1,3,3a,4,7,7a-hexahydro-1,1-dimethyl-4,7-epoxyisobenzofuran  
(9CI) (CA INDEX NAME)  
CM 1  
CRN 479075-38-2  
CMF C10 H14 O2



CM 2  
CRN 367250-28-0  
CMF C19 H28 O2



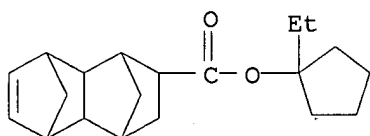
RN 479075-48-4 HCAPLUS  
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-  
octahydro-, 1-ethylcyclopentyl ester, polymer with 1,3,3a,4,7,7a-hexahydro-  
1,1-dimethyl-4,7-epoxyisobenzofuran (9CI) (CA INDEX NAME)  
CM 1  
CRN 479075-38-2  
CMF C10 H14 O2



CM 2

CRN 279243-82-2

CMF C20 H28 O2



L44 ANSWER 8 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:886513 HCAPLUS

DN 137:391068

TI Photoresist compositions with high resolution, good pattern shape, and reduced edge roughness for electron beam or x-ray photolithography in semiconductor device fabrication

IN Yasunami, Shoichiro; Takahashi, Omote

PA Fuji Photo Film Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 47 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G03F007-039

ICS G03F007-004; G03F007-038; H01L021-027

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002333714	A2	20021122	JP 2001-139097	20010509
PRAI	JP 2001-139097		20010509		
OS	MARPAT 137:391068				

AB The compns. comprise (A) photoacid generators, (B) N-contg. compds. generating carboxyl groups in a mol. by acids, and (C) alkali-insol. resins that increase their alkali soly. by acids for pos. photoresists. Alternatively, the compns. contain A, B, (D) alkali-sol. resins, and (E) crosslinkers that react with D by acids for neg. photoresists.

ST photoresist chem amplification edge roughness prevention; amine electron beam photoresist resolu; semiconductor device fabrication photoresist x ray

IT X-ray resists

(photoresist compns. with high resolu. and good pattern shape for electron beam or x-ray photolithog.)

IT 161679-94-3P 185502-14-1P 197087-74-4P 475673-37-1P 475673-38-2P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(crosslinker, neg. resist contg.; photoresist compns. with high resolu. and good pattern shape for electron beam or x-ray photolithog.)

IT 3089-11-0 32449-09-5

RL: TEM (Technical or engineered material use); USES (Uses)

(crosslinker, neg. resist contg.; photoresist compns. with high resolu. and good pattern shape for electron beam or x-ray photolithog.)

IT 24979-69-9P 24979-70-2P 24979-73-5P 24979-74-6P

**173786-80-6DP**, 4-Acetoxystyrene-4-methoxystyrene copolymer, hydrolyzed 321164-59-4P 345212-59-1P 396098-38-7P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(neg. resist contg.; **photoresist** compns. with high resolu. and good **pattern** shape for electron beam or x-ray photolithog.)

IT 162846-57-3P 212555-24-3P, 4-Cyclohexylphenoxyethyl vinyl ether

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(photoresist compns. with high resolu. and good pattern shape for electron beam or x-ray photolithog.)

IT 64113-91-3P 85451-11-2P 88722-74-1P 94391-95-4P 113131-45-6P

147202-35-5P 475673-33-7P 475673-34-8P 475673-35-9P 475673-36-0P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(photoresist compns. with high resolu. and good pattern shape for electron beam or x-ray photolithog.)

IT 50-00-0, Formaldehyde, reactions 110-75-8, 2-Chloroethyl vinyl ether

609-36-9, Proline 1131-60-8, p-Cyclohexylphenol 110726-28-8, Trisp PA

RL: RCT (Reactant); RACT (Reactant or reagent)

(photoresist compns. with high resolu. and good pattern shape for electron beam or x-ray photolithog.)

IT 24979-70-2DP, esters 24979-70-2DP, VP 8000, reaction products with

cyclohexylphenoxyethyl vinyl ether 158593-28-3P 160309-96-6DP,

p-Acetoxystyrene-tert-butyl methacrylate copolymer, hydrolyzed

212555-24-3DP, 4-Cyclohexylphenoxyethyl vinyl ether, reaction products

with polyhydroxystyrene 279244-37-0P 288620-13-3P 289706-80-5P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(pos. resist contg.; photoresist compns. with high resolu. and good pattern shape for electron beam or x-ray photolithog.)

IT **173786-80-6DP**, 4-Acetoxystyrene-4-methoxystyrene copolymer,

hydrolyzed

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(neg. resist contg.; **photoresist** compns. with high resolu. and good **pattern** shape for electron beam or x-ray photolithog.)

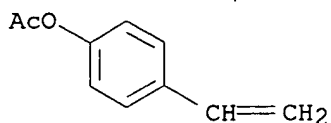
RN 173786-80-6 HCAPLUS

CN Phenol, 4-ethenyl-, acetate, polymer with 1-ethenyl-4-methoxybenzene (9CI)  
(CA INDEX NAME)

CM 1

CRN 2628-16-2

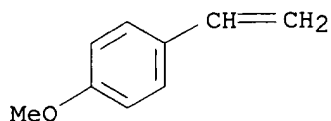
CMF C10 H10 O2



CM 2

CRN 637-69-4

CMF C9 H10 O



L44 ANSWER 9 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:794185 HCAPLUS  
 DN 137:317926  
 TI Polymer, resist composition and patterning process  
 IN Nishi, Tsunehiro; Nakashima, Mutsuo; Tachibana, Seiichiro; Funatsu, Kenji  
 PA Shin-Etsu Chemical Co., Ltd., Japan  
 SO U.S. Pat. Appl. Publ., 38 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM G03F007-038  
 ICS G03F007-20; G03F007-38; G03F007-40; G03F007-30  
 NCL 430270100  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 35, 38

*applicants*

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002150835	A1	20021017	US 2002-73223	20020213
	JP 2002317016	A2	20021031	JP 2002-21562	20020130
PRAI	JP 2001-37247	A	20010214		
	JP 2001-37262	A	20010214		
	JP 2001-37271	A	20010214		
AB	A novel polymer is obtained by copolymerizing a (meth)acrylic acid deriv. with a vinyl ether compd., an allyl ether compd. and an oxygen-contg. alicyclic olefin compd. A photoresist compn. comprising the polymer as a base resin is sensitive to high-energy radiation, has excellent sensitivity, resolu., etching resistance, and minimized swell and lends itself to micropatterning with electron beams or deep-UV.				
ST	photoresist polymer compn photolithog				
IT	Photoresists				
	(polymer for photoresist compn. and patterning process)				
IT	Photolithography				
	(vacuum UV; polymer for photoresist compn. and patterning process)				
IT	470722-46-4P 470722-47-5P 470722-48-6P				
	470722-49-7P 470722-50-0P 470722-51-1P				
	470722-52-2P 470722-53-3P 470722-54-4P				

470722-55-5P 470722-56-6P 470722-57-7P 470722-59-9P  
 470722-60-2P 470722-62-4P 470722-64-6P  
 470722-65-7P 470722-66-8P 470722-67-9P 470722-68-0P  
 470722-69-1P 470722-70-4P 470722-71-5P  
 470722-72-6P 470722-73-7P 470722-74-8P  
 470722-75-9P 470722-76-0P

RL: PRP (Properties); SPN (Synthetic preparation); TEM  
 (Technical or engineered material use); PREP (Preparation); USES  
 (Uses)

(polymer for photoresist compn. and patterning  
 process)

IT 470722-46-4P 470722-47-5P 470722-48-6P  
 470722-49-7P 470722-50-0P 470722-51-1P  
 470722-52-2P 470722-53-3P 470722-54-4P  
 470722-55-5P 470722-59-9P 470722-60-2P  
 470722-62-4P 470722-64-6P 470722-65-7P  
 470722-66-8P 470722-69-1P 470722-70-4P  
 470722-71-5P 470722-72-6P 470722-73-7P  
 470722-74-8P

RL: PRP (Properties); SPN (Synthetic preparation); TEM  
 (Technical or engineered material use); PREP (Preparation); USES  
 (Uses)

(polymer for photoresist compn. and patterning  
 process)

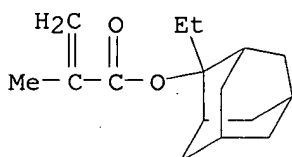
RN 470722-46-4 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
 polymer with 1-(ethenyloxy)-2-methylpropane (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

CMF C16 H24 O2



CM 2

CRN 109-53-5

CMF C6 H12 O

i-BuO-CH=CH<sub>2</sub>

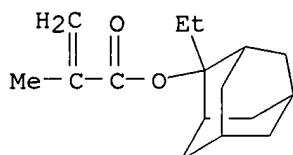
RN 470722-47-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
 polymer with ethenyl acetate (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

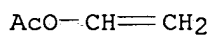
CMF C16 H24 O2



CM 2

CRN 108-05-4

CMF C4 H6 O2



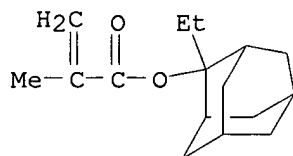
RN 470722-48-6 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with (ethenyloxy)cyclohexane (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

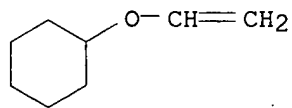
CMF C16 H24 O2



CM 2

CRN 2182-55-0

CMF C8 H14 O



RN 470722-49-7 HCAPLUS

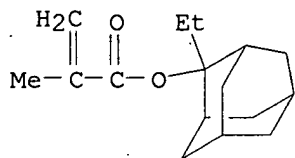
CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with 2,3-dihydrofuran (9CI) (CA INDEX NAME)

CM 1



CRN 209982-56-9

CMF C16 H24 O2



CM 2

CRN 1191-99-7

CMF C4 H6 O



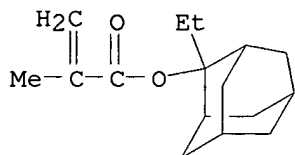
RN 470722-50-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with 3,4-dihydro-2H-pyran (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

CMF C16 H24 O2



CM 2

CRN 110-87-2

CMF C5 H8 O



RN 470722-51-1 HCAPLUS

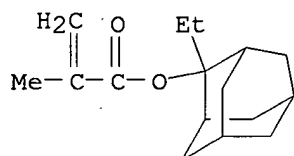
CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,

polymer with 2-ethoxy-3,4-dihydro-2H-pyran (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

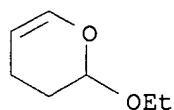
CMF C16 H24 O2



CM 2

CRN 103-75-3

CMF C7 H12 O2



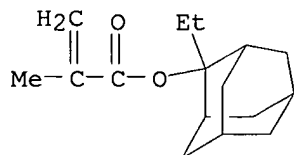
RN 470722-52-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with 1,3-dioxol-2-one (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

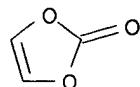
CMF C16 H24 O2



CM 2

CRN 872-36-6

CMF C3 H2 O3



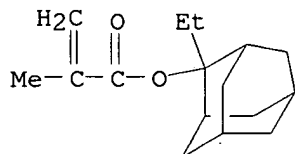
RN 470722-53-3 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
polymer with 5-methyl-2(3H)-furanone (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

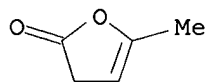
CMF C16 H24 O2



CM 2

CRN 591-12-8

CMF C5 H6 O2



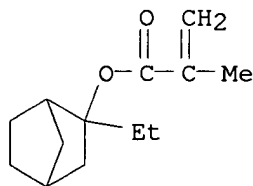
RN 470722-54-4 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethylbicyclo[2.2.1]hept-2-yl ester, polymer  
with 1-(ethenyloxy)-2-methylpropane (9CI) (CA INDEX NAME)

CM 1

CRN 330595-98-7

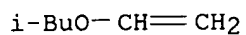
CMF C13 H20 O2



CM 2

CRN 109-53-5

CMF C6 H12 O



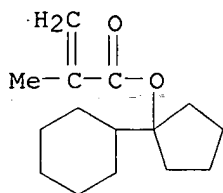
RN 470722-55-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-cyclohexylcyclopentyl ester, polymer with  
1-(ethenyloxy)-2-methylpropane (9CI) (CA INDEX NAME)

CM 1

CRN 366808-98-2

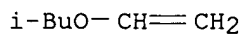
CMF C15 H24 O2



CM 2

CRN 109-53-5

CMF C6 H12 O



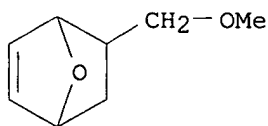
RN 470722-59-9 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
polymer with 5-(methoxymethyl)-7-oxabicyclo[2.2.1]hept-2-ene (9CI) (CA  
INDEX NAME)

CM 1

CRN 470722-58-8

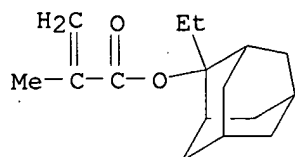
CMF C8 H12 O2



CM 2

CRN 209982-56-9

CMF C16 H24 O2



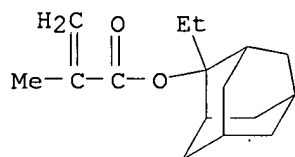
RN 470722-60-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.13,7]dec-2-yl ester,  
polymer with 7-oxabicyclo[2.2.1]hept-5-ene-2-methanol (9CI) (CA INDEX  
NAME)

CM 1

CRN 209982-56-9

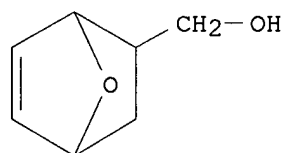
CMF C16 H24 O2



CM 2

CRN 89898-05-5

CMF C7 H10 O2



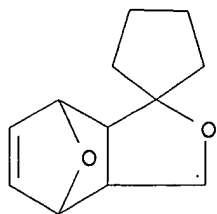
RN 470722-62-4 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.13,7]dec-2-yl ester,  
polymer with 3'a,4',7',7'a-tetrahydrospiro[cyclopentane-1,1'(3'H)-  
[4,7]epoxyisobenzofuran] (9CI) (CA INDEX NAME)

CM 1

CRN 470722-61-3

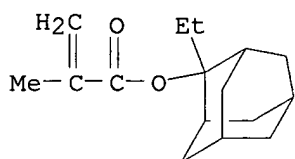
CMF C12 H16 O2



CM 2

CRN 209982-56-9

CMF C16 H24 O2



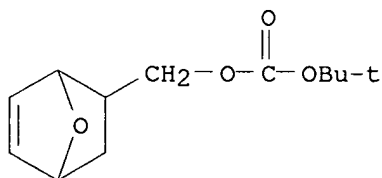
RN 470722-64-6 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.13,7]dec-2-yl ester,  
polymer with 1,1-dimethylethyl 7-oxabicyclo[2.2.1]hept-5-en-2-ylmethyl  
carbonate (9CI) (CA INDEX NAME)

CM 1

CRN 470722-63-5

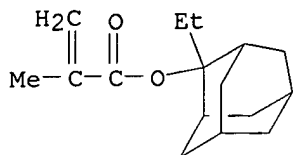
CMF C12 H18 O4



CM 2

CRN 209982-56-9

CMF C16 H24 O2



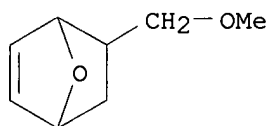
RN 470722-65-7 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethylbicyclo[2.2.1]hept-2-yl ester, polymer  
with 5-(methoxymethyl)-7-oxabicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX  
NAME)

CM 1

CRN 470722-58-8

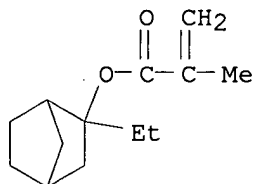
CMF C8 H12 O2



CM 2

CRN 330595-98-7

CMF C13 H20 O2



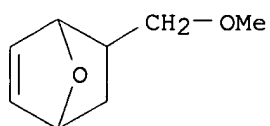
RN 470722-66-8 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-cyclohexylcyclopentyl ester, polymer with  
5-(methoxymethyl)-7-oxabicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 470722-58-8

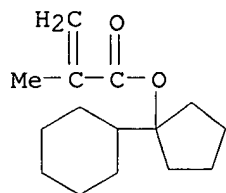
CMF C8 H12 O2



CM 2

CRN 366808-98-2

CMF C15 H24 O2



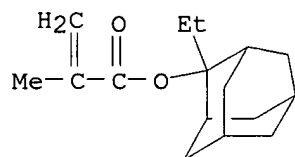
RN 470722-69-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.13,7]dec-2-yl ester, polymer with 3,3-diethoxy-1-propene (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

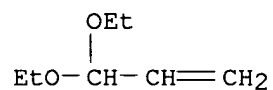
CMF C16 H24 O2



CM 2

CRN 3054-95-3

CMF C7 H14 O2



RN 470722-70-4 HCAPLUS

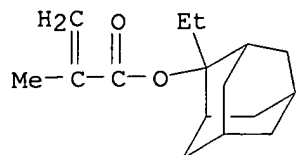
CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.13,7]dec-2-yl ester, polymer with 2-ethenyl-1,3-dioxolane (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

CMF C16 H24 O2

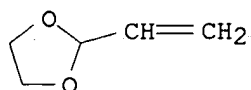




CM 2

CRN 3984-22-3

CMF C5 H8 O2



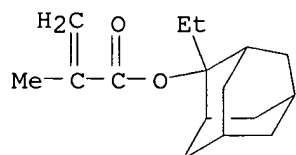
RN 470722-71-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1.3,7]dec-2-yl ester,  
polymer with 2-propenyl acetate (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

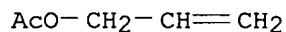
CMF C16 H24 O2



CM 2

CRN 591-87-7

CMF C5 H8 O2



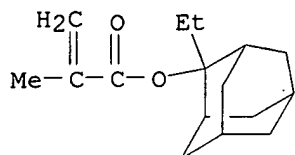
RN 470722-72-6 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1.3,7]dec-2-yl ester,  
polymer with 2,5-dihydrofuran (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

CMF C16 H24 O2



CM 2

CRN 1708-29-8

CMF C4 H6 O



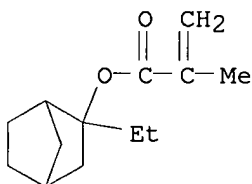
RN 470722-73-7 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethylbicyclo[2.2.1]hept-2-yl ester, polymer with 2-ethenyl-1,3-dioxolane (9CI) (CA INDEX NAME)

CM 1

CRN 330595-98-7

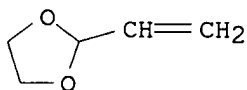
CMF C13 H20 O2



CM 2

CRN 3984-22-3

CMF C5 H8 O2

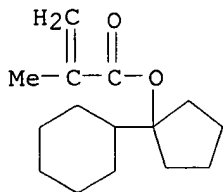


RN 470722-74-8 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-cyclohexylcyclopentyl ester, polymer with 2-ethenyl-1,3-dioxolane (9CI) (CA INDEX NAME)

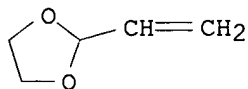
CM 1

CRN 366808-98-2  
CMF C15 H24 O2



CM 2

CRN 3984-22-3  
CMF C5 H8 O2



L44 ANSWER 10 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:792710 HCAPLUS

DN 137:317922

TI Positive photoresist compositions offering sharp patterns

IN Sato, Kenichiro

PA Fuji Photo Film Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 85 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G03F007-039

ICS C08K005-00; C08K005-06; C08L101-02; G03F007-004; H01L021-027;  
C07C025-02; C07C043-303; C07C043-305; C07C307-02; C07C309-06;  
C07C317-28; C07C381-12

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002303984	A2	20021018	JP 2001-135245	20010502
PRAI	JP 2001-22010	A	20010130		
OS	MARPAT 137:317922				

AB The pos. photoresist compns. which give fine patterns with good profile, smoother line edges, and no top profile erosion for ArF excimer laser lithog. contain (A) resins which have alicyclic hydrocarbon groups and increase soly. speed to alkali developers by acids, (B) compds. which generate acids by actinic light or radiation, and (C) acetals shown as R101OCHMeOR102 or R102OCHMeOR102 (R101, R102 = alkyl which may have linear, branched, or cyclic substituents).

ST pos photoresist chem amplified alicyclic hydrocarbon acetal; deep UV resist pos alicyclic hydrocarbon acetal

IT Positive photoresists

(pos. photoresist compns. offering sharp patterns)

IT 1886-74-4 66003-78-9 69842-77-9 116808-67-4 133710-62-0  
 138529-81-4 145612-66-4 171417-91-7 177786-96-8 220155-94-2  
 241806-75-7 258341-99-0 258342-00-6 258872-05-8 260061-58-3  
 284474-28-8 301525-08-6 307531-76-6 312386-77-9 391232-40-9

RL: CAT (Catalyst use); USES (Uses)

(photoacid generator; pos. photoresist compns. offering sharp patterns)

IT **250378-10-0P** 288303-55-9P 364736-22-1P 391232-36-3P  
 391613-77-7P 398140-36-8P 398140-40-4P 398140-43-7P 398140-45-9P  
 398140-47-1P 398140-48-2P 398140-50-6P 398140-52-8P 398140-55-1P  
 398140-57-3P 398140-59-5P 398140-60-8P 398140-62-0P 398140-64-2P  
 398140-65-3P 398140-68-6P 398140-69-7P 398140-71-1P 398140-72-2P  
 398140-73-3P 398140-74-4P 398140-76-6P 398140-77-7P 398140-78-8P  
 398140-79-9P 398140-80-2P 398140-81-3P 398140-82-4P 398140-84-6P  
 398140-85-7P 398140-86-8P 398140-88-0P 398140-89-1P 398140-90-4P  
 398140-91-5P 398140-92-6P 398140-93-7P 398140-94-8P 398140-95-9P  
 398140-97-1P 398140-98-2P 398140-99-3P 398141-00-9P 398141-03-2P  
 398141-04-3P 398141-05-4P 398141-06-5P 398141-07-6P 398141-08-7P  
 398141-10-1P 398141-11-2P 398141-13-4P 398141-14-5P 398141-16-7P  
 398152-52-8P 405509-18-4P 405509-19-5P 405509-25-3P 405509-30-0P  
 412015-86-2P 471257-28-0P

RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(pos. photoresist compns. offering sharp patterns)

IT 297742-34-8

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

(pos. photoresist compns. offering sharp patterns)

IT 926-02-3, tert-Butyl vinyl ether 4442-79-9, Cyclohexyl ethanol  
 5240-72-2, 2-Norbornanemethanol 27779-29-9, Isopinocampheol

RL: RCT (Reactant); RACT (Reactant or reagent)

(pos. photoresist compns. offering sharp patterns)

IT **250378-10-0P**RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(pos. photoresist compns. offering sharp patterns)

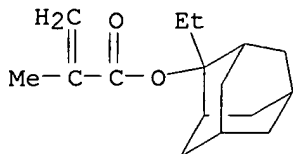
RN 250378-10-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
 polymer with tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA  
 INDEX NAME)

CM 1

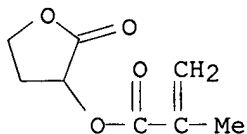
CRN 209982-56-9

CMF C16 H24 O2



CM 2

CRN 195000-66-9  
CMF C8 H10 O4



L44 ANSWER 11 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:792707 HCAPLUS

DN 137:317920

TI Positive photoresist compositions with suppressed variation of sensitivity on pattern density for patterning using halftone phase shift masks without side-lobe formation

IN Uenishi, Kazuya; Sato, Kenichiro; Aogo, Toshiaki

PA Fuji Photo Film Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 93 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

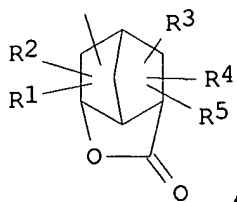
IC ICM G03F007-039

ICS C08F220-10; C08F222-06; C08F232-08; H01L021-027

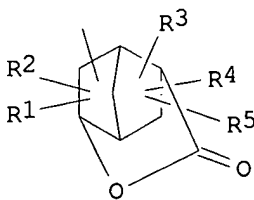
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

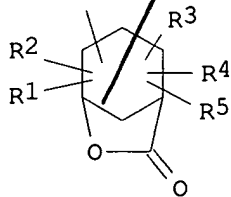
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002303981	A2	20021018	JP 2001-108727	20010406
PRAI	JP 2001-108727		20010406		
GI					



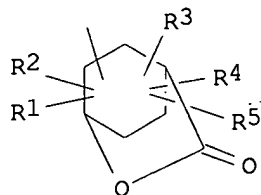
I



II



III

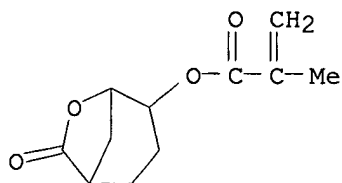


IV

- AB The pos. photoresist compns. which give patterns with good profiles by lithog. using ArF excimer laser irradian. contain (A) compds. which generate acids by irradiating actinic light or radiation and (B) (B1) polymers bearing repeating units of maleic anhydride derivs and/or  $\text{CH}[\text{C}(\text{O})\text{XAR1}]\text{CH}[\text{C}(\text{O})\text{XAR2}]$  [R1, R2 = H, CN, OH, CO2H, CO2R5, CONHR6, CONHSO2R6, (substituted) alkyl, alkoxy, cyclic hydrocarbyl, Y; X = O, S, NH, NHSO2, NHSO2NH; R5 = (substituted) alkyl, cyclic hydrocarbyl, Y; R6 = single bond, divalent linkage; Y = lactone ring] and repeating units of cycloolefins such as norbornenes and (B2) polymers which decomp. by acids and increase soly. to alkalis, bearing lactone units I-IV [R1-R5 = H, (substituted) alkyl, cycloalkyl, alkenyl; 2 of R1-R5 may be bonded to each other and form ring]. The polymers (B2) may involve adamantyl acrylate-based repeating units. The compns. may contain (C) acid diffusion retarders.
- ST pos photoresist halftone phase shift mask lithog; deep UV resist pos halftone phase shift mask lithog
- IT Positive photoresists  
(pos. photoresist compns. with suppressed variation of sensitivity on pattern d. for patterning using halftone phase shift masks without side lobe formation)
- IT 102-82-9, Tributylamine 3001-72-7, 1,5-Diazabicyclo[4.3.0]-5-nonene 41556-26-7, Bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate  
RL: NUU (Other use, unclassified); USES (Uses)  
(acid diffusion inhibitor; pos. photoresist compns. with suppressed variation of sensitivity on pattern d. for patterning using halftone phase shift masks without side lobe formation)
- IT 59626-68-5 66003-78-9 84563-54-2 116808-67-4 144089-15-6  
153698-46-5 177786-98-0 301525-08-6 307976-40-5 312386-77-9  
391232-40-9  
RL: CAT (Catalyst use); USES (Uses)  
(photoacid generator; pos. photoresist compns. with suppressed variation of sensitivity on pattern d. for patterning using halftone phase shift masks without side lobe formation)
- IT **335163-71-8P 335163-73-0P 335163-79-6P**  
**340964-24-1P 340964-31-0P 340964-38-7P 364736-20-9P**  
398140-57-3P 398140-59-5P 398140-60-8P 398140-62-0P 398140-64-2P  
398140-65-3P 398140-68-6P 398140-69-7P 398140-71-1P 398140-72-2P  
398140-73-3P 398140-74-4P 428516-13-6P **469886-31-5P**  
470482-90-7P  
RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(pos. **photoresist** compns. with suppressed variation of sensitivity on **pattern d.** for **patterning** using halftone phase shift masks without side lobe formation)
- IT **335163-71-8P 335163-73-0P 340964-24-1P**  
**340964-31-0P 469886-31-5P**  
RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(pos. **photoresist** compns. with suppressed variation of sensitivity on **pattern d.** for **patterning** using halftone phase shift masks without side lobe formation)
- RN 335163-71-8 HCAPLUS
- CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with 7-oxo-6-oxabicyclo[3.2.1]oct-4-yl 2-methyl-2-propenoate (9CI)  
(CA INDEX NAME)

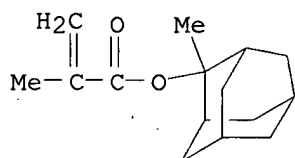
CM 1

CRN 335163-70-7  
CMF C11 H14 O4



CM 2

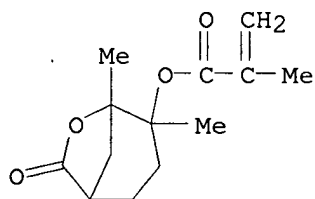
CRN 177080-67-0  
CMF C15 H22 O2



RN 335163-73-0 HCAPLUS  
CN 2-Propenoic acid, 2-methyl-, 4,5-dimethyl-7-oxo-6-oxabicyclo[3.2.1]oct-4-yl ester, polymer with 2-methyltricyclo[3.3.1.1.3,7]dec-2-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

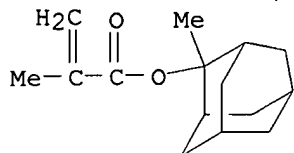
CM 1

CRN 329364-29-6  
CMF C13 H18 O4



CM 2

CRN 177080-67-0  
CMF C15 H22 O2



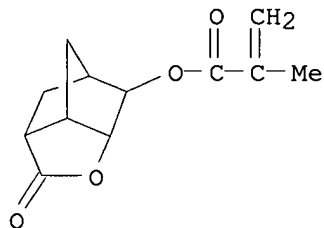
RN 340964-24-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, hexahydro-2-oxo-3,5-methano-2H-cyclopenta[b]furan-6-yl ester, polymer with 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 254900-07-7

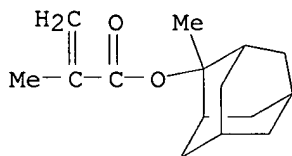
CMF C12 H14 O4



CM 2

CRN 177080-67-0

CMF C15 H22 O2



RN 340964-31-0 HCAPLUS

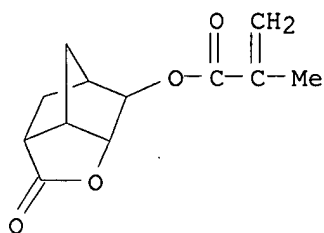
CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with hexahydro-2-oxo-3,5-methano-2H-cyclopenta[b]furan-6-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 254900-07-7

CMF C12 H14 O4

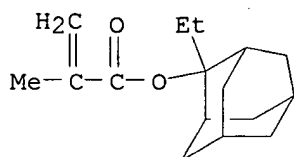




CM 2

CRN 209982-56-9

CMF C16 H24 O2



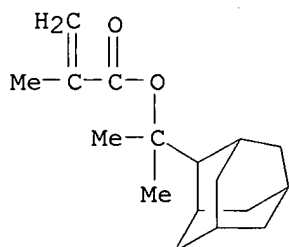
RN 469886-31-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-methyl-1-tricyclo[3.3.1.1<sup>3,7</sup>]dec-2-ylethyl ester, polymer with 7-oxo-6-oxabicyclo[3.2.1]oct-4-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 443648-84-8

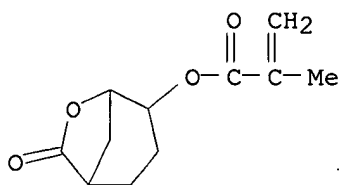
CMF C17 H26 O2



CM 2

CRN 335163-70-7

CMF C11 H14 O4



L44 ANSWER 12 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:716915 HCAPLUS

DN 137:270511

TI Polymers, resist materials, and pattern formation method

IN Nishi, Tsunehiro; Hasegawa, Koji; Nakashima, Mutsuo

PA Japan

SO U.S. Pat. Appl. Publ., 37 pp.

CODEN: USXXCO

DT Patent

LA English

IC ICM G03F007-039

ICS G03F007-38; G03F007-40

NCL 430270100

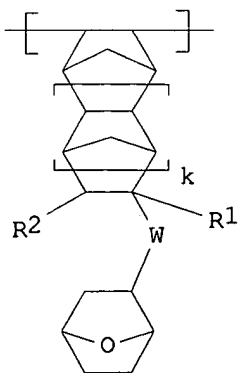
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 35, 38

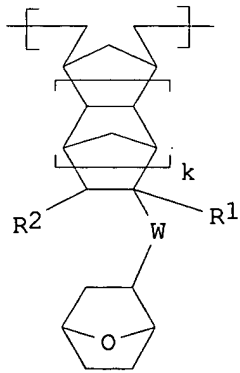
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002132182	A1	20020919	US 2002-50478	20020116
	JP 2002303985	A2	20021018	JP 2002-8244	20020117
PRAI	JP 2001-8613	A	20010117		

GI



I



II

AB The present invention provides (1) a polymer which has excellent reactivity, rigidity and adhesion to the substrate, and undergoes a low degree of swelling during development, (2) a resist material which uses this polymer as the base resin and hence exhibits much higher resolving power and etching resistance than conventional resist materials, and (3) a pattern formation method using this resist material. Specifically, the present invention provides a novel polymer contg. repeating units

represented by I, II (R1 = H, Me, CH<sub>2</sub>CO<sub>2</sub>R<sub>3</sub>; R<sub>2</sub> = H, Me, CO<sub>2</sub>R<sub>3</sub>; R<sub>3</sub> = C1-15 alkyl; W = C2-20 divalent hydrocarbon radical, which may have .gtoreq. 1 ester linkage in its structure and may further be substituted by one or more other at. group contg. a heteroatom; k = 0,1) and having a wt.-av. mol. wt. of 1,000-500,000, a resist material using the polymer as a base resin, and a pattern formation method using the resist material.

ST photoresist compn photolithog polymer

IT Photolithography

Photoresists

(polymers, photoresist materials, and pattern formation method)

IT 461671-53-4P 461671-55-6P 461671-57-8P 461671-59-0P 461671-60-3P

461671-61-4P 461671-62-5P **461671-63-6P 461671-64-7P**

461671-65-8P 461671-66-9P **461671-68-1P**

RL: PRP (Properties); **SPN (Synthetic preparation)**; TEM

(Technical or engineered material use); **PREP (Preparation)**; USES  
(Uses)

(polymers, **photoresist** materials, and **pattern**  
formation method)

IT **461671-63-6P 461671-64-7P 461671-68-1P**

RL: PRP (Properties); **SPN (Synthetic preparation)**; TEM

(Technical or engineered material use); **PREP (Preparation)**; USES  
(Uses)

(polymers, **photoresist** materials, and **pattern**  
formation method)

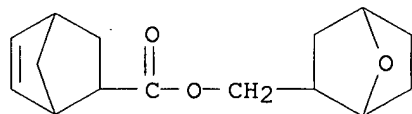
RN 461671-63-6 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-ethylcyclopentyl ester,  
polymer with 7-oxabicyclo[2.2.1]hept-2-ylmethyl bicyclo[2.2.1]hept-5-ene-2-  
carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 461671-52-3

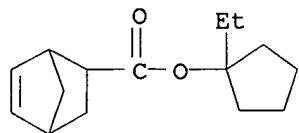
CMF C15 H20 O3



CM 2

CRN 279243-69-5

CMF C15 H22 O2



RN 461671-64-7 HCAPLUS

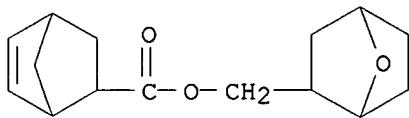
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-cyclohexylcyclopentyl ester,  
polymer with 7-oxabicyclo[2.2.1]hept-2-ylmethyl bicyclo[2.2.1]hept-5-ene-2-

carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 461671-52-3

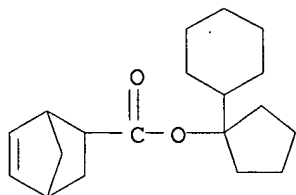
CMF C15 H20 O3



CM 2

CRN 367250-28-0

CMF C19 H28 O2



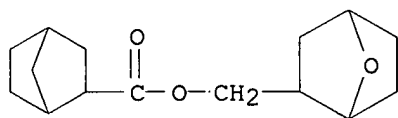
RN 461671-68-1 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-,  
1-ethylcyclopentyl ester, polymer with 7-oxabicyclo[2.2.1]hept-2-ylmethyl  
bicyclo[2.2.1]heptane-2-carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 461671-67-0

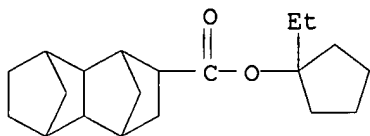
CMF C15 H22 O3



CM 2

CRN 279244-51-8

CMF C20 H30 O2



L44 ANSWER 13 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:673047 HCAPLUS

DN 137:224108

TI Storage-stable excimer laser-sensitive positive-working photosensitive compositions with reduced pattern variation on defocusing

IN Kodama, Kunihiro; Sato, Kenichiro

PA Fuji Photo Film Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 86 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G03F007-039

ICS C08K005-00; C08K005-36; C08L101-00; G03F007-004; H01L021-027

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002251012	A2	20020906	JP 2001-48784	20010223
	US 2003017415	A1	20030123	US 2002-79414	20020222
PRAI	JP 2001-48602	A	20010223		
	JP 2001-48783	A	20010223		
	JP 2001-48784	A	20010223		
	JP 2001-48880	A	20010223		
	JP 2001-157366	A	20010525		
	JP 2001-157367	A	20010525		
AB	The compns. comprise (A) photoacid generators, (B) resins contg. alicyclic hydrocarbon structures, which increase their alkali soly. by acid decompn., (C) base compds., and (D) fluoro- and/or silicone-based surfactants, wherein the photoacid generator is a mixt. of triarylsulfonium salts and non-arom. sulfonium salts. The compns. are useful for chem. amplified photoresists suitable for halftone phase-shift masks.				
ST	pos photoresist excimer laser storage stability; chem amplification photoresist arylsulfonium photoacid generator				
IT	Positive photoresists (UV; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)				
IT	Sulfonium compounds RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (arene, photoacid generators; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)				
IT	Surfactants (fluorosurfactants; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)				
IT	Cycloalkenes				

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polymers; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT Aromatic compounds

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(sulfonium, photoacid generators; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT Polysiloxanes, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(surfactant; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT 66003-78-9 144317-44-2 177034-80-9 258872-05-8 284474-28-8

338445-24-2 391232-40-9 398141-18-9 421555-72-8

RL: CAT (Catalyst use); USES (Uses)

(arom. sulfonyl photoacid generator; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT 484-47-9, 2,4,5-Triphenylimidazole 621-77-2, Triphenylamine 3001-72-7,

1,5-Diazabicyclo[4.3.0]non-5-ene 3040-44-6, 1-Piperidineethanol

19293-63-1, Dicyclohexylmethylamine 19600-49-8, Triphenylsulfonium acetate

RL: TEM (Technical or engineered material use); USES (Uses)

(base compd.; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT 3744-08-9P, Triphenylsulfonium iodide 303177-16-4P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT 250378-10-0P, Butyrolactone methacrylate-2-ethyl-2-adamantyl

methacrylate copolymer 288303-55-9P 364736-22-1P 391232-36-3P

391613-77-7P 398140-36-8P 398140-38-0P 398140-40-4P 398140-43-7P

398140-45-9P 398140-50-6P 398140-52-8P 398140-54-0P 398140-55-1P

398140-57-3P 398140-59-5P 398140-60-8P 398140-62-0P 398140-64-2P

398140-65-3P 398140-68-6P 398140-69-7P 398140-71-1P 398140-72-2P

398140-73-3P 398140-74-4P 398140-75-5P 398140-76-6P 398140-77-7P

398140-78-8P 398140-79-9P 398140-80-2P 398140-81-3P 398140-82-4P

398140-84-6P 398140-85-7P 398140-86-8P 398140-87-9P 398140-88-0P,

tert-Butyl norbornenecarboxylate-maleic anhydride-2-methyl-2-adamantyl

acrylate-norbornenelactone acrylate copolymer 398140-89-1P

398140-90-4P 398140-91-5P 398140-92-6P 398140-93-7P 398140-94-8P

398140-95-9P 398140-97-1P 398140-98-2P 398140-99-3P 398141-00-9P

398141-03-2P 398141-04-3P 398141-06-5P 398141-07-6P 398141-08-7P

398141-10-1P 398141-11-2P 398141-13-4P 398141-14-5P 398141-16-7P

398152-52-8P 405509-18-4P 405509-29-7P 405509-30-0P 455521-67-2P

455521-72-9P

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT 71-43-2, Benzene, reactions 110-01-0, Tetrahydrothiophene 945-51-7,

Diphenylsulfoxide 1763-23-1, Perfluorooctanesulfonic acid 5469-26-1,

1-Bromo-3,3-dimethyl-2-butanone 12027-06-4, Ammonium iodide

29420-49-3, Potassium perfluorobutanesulfonate 218151-20-3 455947-79-2

RL: RCT (Reactant); RACT (Reactant or reagent)

(chem. amplified storage-stable excimer laser-sensitive pos.

photoresists with reduced pattern variation on defocusing)

IT 160481-39-0 301153-78-6 371921-65-2 383367-32-6 393171-41-0  
455521-76-3 455521-81-0 455521-85-4 455521-89-8

RL: CAT (Catalyst use); USES (Uses)

(non-arom. sulfonyl photoacid generator; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT 171292-12-9

RL: CAT (Catalyst use); USES (Uses)

(photoacid generator; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT 144089-15-6P 241806-75-7P 347193-29-7P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(photoacid generator; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT 96-48-0, .gamma.-Butyrolactone 97-64-3, Ethyl lactate 108-94-1,  
Cyclohexanone, uses 110-43-0, 2-Heptanone 763-69-9 1320-67-8,  
Propylene glycol methyl ether 84540-57-8, Propylene glycol methyl ether acetate

RL: NUU (Other use, unclassified); USES (Uses)

(solvent; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT 137462-24-9, Megafac F 176 216679-67-3, Megafac R 08

RL: TEM (Technical or engineered material use); USES (Uses)

(surfactant; chem. amplified storage-stable excimer laser-sensitive pos. photoresists with reduced pattern variation on defocusing)

IT **250378-10-0P**, Butyrolactone methacrylate-2-ethyl-2-adamantyl methacrylate copolymer

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(chem. amplified storage-stable excimer laser-sensitive pos. **photoresists** with reduced **pattern** variation on defocusing)

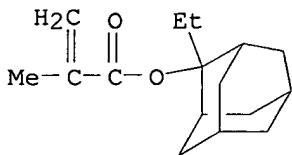
RN 250378-10-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 209982-56-9

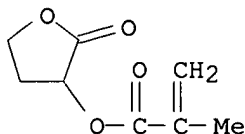
CMF C16 H24 O2



CM 2

CRN 195000-66-9

CMF C8 H10 O4



L44 ANSWER 14 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:656154 HCAPLUS

DN 137:208370

TI Chemically amplified photoresist composition containing specific fluoro vinyl polymer and method for pattern formation using the same

IN Brock, Phillip J.; Dawson, Daniel J.; Ito, Hiroshi; Wallraff, Gregory Michael

PA International Business Machines Corp., USA

SO Jpn. Kokai Tokkyo Koho, 20 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G03F007-039

ICS C08F020-04; C08F020-10; C08F020-42; C08F020-54; G03F007-038; H01L021-027

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 35, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002244300	A2	20020830	JP 2002-16785	20020125
	US 2002146639	A1	20021010	US 2001-771261	20010126
PRAI	US 2001-771261	A	20010126		
AB	The title compn. contains a fluorovinyl polymer and a radiation-ray-sensitive acid generator, wherein the fluorovinyl polymer contains carboxylic acid, nitrile, amide or an acid-sensitive pendant group. The compn. is transparent towards .ltoreq.250 nm light.				
ST	amplified photoresist compn fluorovinyl polymer				
IT	Photoresists				
	Semiconductor device fabrication				
	(chem. amplified photoresist compn. and method for pattern formation using same)				
IT	67-56-1, Methanol, reactions 79-37-8, Oxalyl chloride 337-16-6, .alpha.-Hydroxy-.alpha.-(trifluoromethyl)propionic acid methyl ester 421-50-1, 1,1,1-Trifluoroacetone 428-18-2, .alpha.-Acetoxy-.alpha.-(trifluoromethyl)propionic acid methyl ester 917-61-3, Sodium cyanate				
RL:	RCT (Reactant); RACT (Reactant or reagent)				
	(chem. amplified photoresist compn. and method for pattern formation using same)				
IT	108-24-7P, Acetic anhydride 335-08-0P, 1,1,1-Trifluoroacetonecyanohydrin 381-84-0P, 2-(Trifluoromethyl)acrylonitrile 381-98-6P, 2-(Trifluoromethyl)acrylic acid 382-43-4P, 3-Hydroxy-2-(trifluoromethyl)propionic acid 105935-24-8P				



RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(chem. amplified photoresist compn. and method for pattern formation using same)

IT 79313-91-0P 105935-25-9P **452332-37-5P**

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(chem. amplified **photoresist** compn. and method for **pattern** formation using same)

IT **452332-37-5P**

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(chem. amplified **photoresist** compn. and method for **pattern** formation using same)

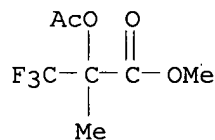
RN 452332-37-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, methyl ester, polymer with methyl 2-(acetyloxy)-3,3,3-trifluoro-2-methylpropanoate (9CI) (CA INDEX NAME)

CM 1

CRN 428-18-2

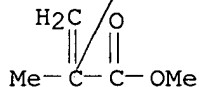
CMF C7 H9 F3 O4



CM 2

CRN 80-62-6

CMF C5 H8 O2



L44 ANSWER 15 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:575607 HCAPLUS

DN 137:132115

TI Polymer, resist composition and patterning process

IN Nishi, Tsunehiro; Nakashima, Mutsuo; Kobayashi, Tomohiro

PA Shin-Etsu Chemical Co., Ltd., Japan

SO U.S. Pat. Appl. Publ., 35 pp.

CODEN: USXXCO

DT Patent

LA English

IC ICM G03F007-038

ICS G03F007-38; G03F007-40; G03F007-30

NCL 430270100

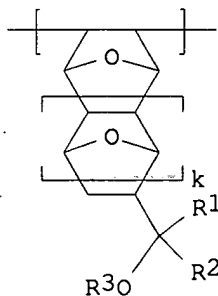
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other

## Reprographic Processes)

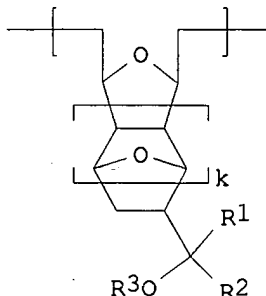
Section cross-reference(s): 35, 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002102493	A1	20020801	US 2001-221	20011204
	JP 2002234913	A2	20020823	JP 2001-363803	20011129
PRAI	JP 2000-368672	A	20001204		
GI					



I



II

AB The present invention relates to a polymer comprising recurring units of I, II (R<sub>1,2</sub> = H, C<sub>1-15</sub> alkyl, R<sub>1,2</sub> taken together, may form a ring; R<sub>3</sub> = H, C<sub>1-15</sub> alkyl, acyl or alkylsulfonyl or C<sub>2-15</sub> alkoxy carbonyl or alkoxyalkyl which may have halogen substituents; not all R<sub>1-3</sub> are hydrogen; k = 0 or 1) and having a Mw of 1,000-500,000.. The present invention relates to a photoresist compn. comprising the polymer as a base resin which is sensitive to high-energy radiation, has excellent sensitivity, resolu., etching resistance, and minimized swell and lends itself to micropatterning with electron beams or deep-UV.

ST photoresists resin photolithog

IT Photolithography

(UV; polymer photoresist compn. for patterning process)

IT Photoresists

(polymer photoresist compn. for patterning process)

IT 444045-74-3P 444045-76-5P 444045-78-7P 444105-77-5P 444105-79-7P

**444105-81-1P 444105-83-3P 444105-85-5P**

RL: PRP (Properties); **SPN (Synthetic preparation)**; TEM

(Technical or engineered material use); **PREP (Preparation)**; USES

(Uses)

(polymer **photoresist** compn. for **patterning** process)

IT **444105-81-1P 444105-85-5P**

RL: PRP (Properties); **SPN (Synthetic preparation)**; TEM

(Technical or engineered material use); **PREP (Preparation)**; USES

(Uses)

(polymer **photoresist** compn. for **patterning** process)

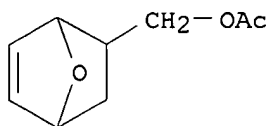
RN 444105-81-1 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-cyclohexylcyclopentyl ester, polymer with 7-oxabicyclo[2.2.1]hept-5-ene-2-methyl acetate (9CI) (CA INDEX NAME)

CM 1

CRN 444105-76-4

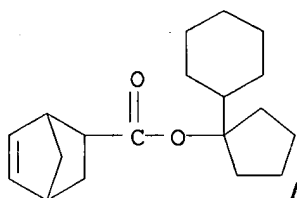
CMF C9 H12 O3



CM 2

CRN 367250-28-0

CMF C19 H28 O2



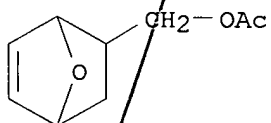
RN 444105-85-5 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-, 1-ethylcyclopentyl ester, polymer with 7-oxabicyclo[2.2.1]hept-5-ene-2-methyl acetate (9CI) (CA INDEX NAME)

CM 1

CRN 444105-76-4

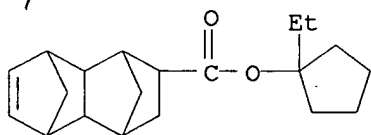
CMF C9 H12 O3



CM 2

CRN 279243-82-2

CMF C20 H28 O2



AN 2002:347849 HCAPLUS  
 DN 136:377474  
 TI Chemically amplified radiation-sensitive resist compositions with good storage stability  
 IN Takahashi, Akira; Sato, Kenichiro; Yasunami, Shoichiro  
 PA Fuji Photo Film Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 57 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM G03F007-075  
 ICS C08G077-04; C08K005-00; C08L083-04; G03F007-004; G03F007-039; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 38, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002131918	A2	20020509	JP 2000-325889	20001025
PRAI	JP 2000-325889		20001025		

AB The compns., showing improved line edge roughness and high resoln. of oscillatory patterns, comprise (A) polymers represented by  $[\text{SiMe}[\text{AOD}(\text{CO}_2\text{X})_r]\text{O}(3-e)/2]$  or by  $[\text{SiNf}[\text{AOD}(\text{OY})_s]\text{O}(3-f)/2]$  [ $\text{A0}$  = single bond, C1-10 alkylene, C3-12 cycloalkylene, C<sub>6</sub>H<sub>4</sub>, LOCO, LCO<sub>2</sub>, LNHCO, etc. (L = C1-10 alkylene, C3-12 cycloalkylene); D = single bond, C1-30 hydrocarbylene, arom. bridge; Me, Nf = C1-12 alkyl, C3-30 cycloalkyl, MeSiO, etc.; e, f = 0, 1; X, Y = H, acid-labile group; r, s = 1-3], (B) photoacid generators, and (C) mixed solvents of c1-c2, c1-c3, or c1-c2-c3 (c1: propylene glycol monoalkyl ether carboxylates; c2: propylene glycol monoalkyl ethers, lactate esters, alkoxyalkyl propionates; c3: .gamma.-butyrolactone, ethylene carbonate, propylene carbonate). The solvents may be mixts. of lactate esters and ester-type solvents and/or alkoxyalkyl propionates. The solvents may contain heptanone.

ST radiation sensitive resist oscillatory pattern resoln; acid labile silsesquioxane chem amplified photoresist; carboxycyclohexyl silsesquioxane amplified photoresist edge roughness

IT Catalysts  
 (photochem., photoacid generators; silsesquioxane-based chem. amplified photoresists contg. sp. mixed solvents and showing good resoln. of oscillatory patterns)

IT Solvents  
 (silsesquioxane-based chem. amplified photoresists contg. sp. mixed solvents and showing good resoln. of oscillatory patterns)

IT Silsesquioxanes  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (silsesquioxane-based chem. amplified photoresists contg. sp. mixed solvents and showing good resoln. of oscillatory patterns)

IT Positive photoresists  
 (silsesquioxane-based chem. amplified pos. photoresists contg. sp. mixed solvents and showing good resoln. of oscillatory patterns)

IT 107-59-5, tert-Butyl chloroacetate 109-92-2, Ethyl vinyl ether  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (esterifying agents; silsesquioxane-based chem. amplified photoresists contg. sp. mixed solvents and showing good resoln. of oscillatory patterns)

IT 247249-72-5DP, hydrolyzed

RL: IMF (Industrial manufacture); PREP (Preparation)

(silsesquioxane-based chem. amplified photoresists contg. sp. mixed solvents and showing good resolu. of oscillatory patterns)

IT 247187-29-7DP, Methyl 3-trichlorosilyl-1-cyclohexylcarboxylate hydrolytic homopolymer, sru, hydrolyzed, esters with Et vinyl ether

**247249-68-9DP**, hydrolyzed, esters with Et vinyl ether

247249-69-ODP, hydrolyzed 247249-75-8P 247249-84-9P 247249-89-4P

247249-91-8P 423164-36-7P 423164-38-9P 423164-39-0P 423164-41-4P

423164-44-7P 423164-46-9P 423164-48-1P 423164-51-6P 423164-52-7P

423164-54-9P 423164-56-1P 423164-58-3P 423164-59-4P 423164-61-8P

423164-62-9P 423164-63-0P 423164-64-1P 423164-65-2P 423164-67-4P

423164-69-6P 423164-70-9P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(silsesquioxane-based chem. amplified **photoresists** contg. sp. mixed solvents and showing good resolu. of oscillatory **patterns**)

IT 96-48-0, .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 97-64-3, Ethyl lactate 108-32-7, Propylene carbonate 110-43-0, 2-Heptanone 1320-67-8, Propylene glycol monomethyl ether 14272-48-1, 2-Ethoxyethyl propionate 84540-57-8, Propylene glycol methyl ether acetate 98516-33-7, Propylene glycol methyl ether propionate

RL: NUU (Other use, unclassified); USES (Uses)

(silsesquioxane-based chem. amplified photoresists contg. sp. mixed solvents and showing good resolu. of oscillatory patterns)

IT **247249-68-9DP**, hydrolyzed, esters with Et vinyl ether

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(silsesquioxane-based chem. amplified **photoresists** contg. sp. mixed solvents and showing good resolu. of oscillatory **patterns**)

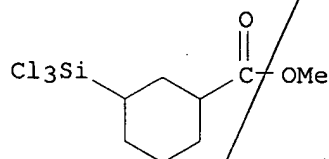
RN 247249-68-9 HCAPLUS

CN Cyclohexanecarboxylic acid, 3-(trichlorosilyl)-, methyl ester, homopolymer, hydrolytic (9CI) (CA INDEX NAME)

CM 1

CRN 219500-81-9

CMF C8 H13 Cl3 O2 Si



CM 2

CRN 7732-18-5

CMF H2 O

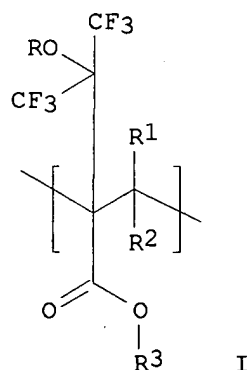
H2O

L44 ANSWER 17 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:315396 HCAPLUS  
 DN 136:332786  
 TI Polymers, resist compositions and patterning process  
 IN Harada, Yuji; Hatakeyama, Jun; Watanabe, Jun; Kawai, Yoshio; Sasago, Masaru; Endo, Masayuki; Kishimura, Shinji; Ootani, Michitaka; Miyazawa, Satoru; Tsutsumi, Kentaro; Maeda, Kazuhiko  
 PA Shin-Etsu Chemical Co., Ltd., Japan; Matsushita Electrical Industrial Co., Ltd.; Central Glass Co., Ltd.  
 SO U.S. Pat. Appl. Publ., 20 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM G03F007-004  
 ICS G03F007-26; C08J003-28  
 NCL 430270100  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 35, 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002048724	A1	20020425	US 2001-947764	20010907
	US 6511787	B2	20030128		
	JP 2002155112	A2	20020528	JP 2001-266846	20010904
PRAI	JP 2000-271234	A	20000907		

GI



AB The present invention relates to an acrylic resin I (R = H, acid labile group, alkyl, C1-20 fluorinated alkyl, acyl, acyl having fluorinated alkyl moiety; R<sub>1,2</sub> = H, F; R<sub>3</sub> = acid labile group, adhesive group, alkyl, C1-20 fluorinated alkyl) which has high transmittance to VUV radiation. The invention provides a resist compn. using the acrylic resin as a base polymer which has high transparency, substrate adhesion, alkali develop-ability and acid-elimination capability and is suited for lithog. microprocessing.

ST photoresist patterning photolithog resin

IT Photolithography

(UV; polymers for photoresist compns. and patterning process)

IT Photoresists

(polymers for photoresist compns. and patterning process)

IT 109-92-2DP, Ethyl vinyl ether, reaction product with hydroxyl group contg. polymer **415683-21-5P 415683-23-7P 415683-25-9P**

415683-26-0P 415683-27-1P 415683-30-6P 415683-32-8DP, reaction product with Et vinyl ether **415683-33-9P** 415683-34-0P

RL: PRP (Properties); **SPN (Synthetic preparation)**; TEM

(Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(polymers for **photoresist** compns. and **patterning** process)

IT **415683-21-5P 415683-23-7P 415683-25-9P**

**415683-33-9P**

RL: PRP (Properties); **SPN (Synthetic preparation)**; TEM

(Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(polymers for **photoresist** compns. and **patterning** process)

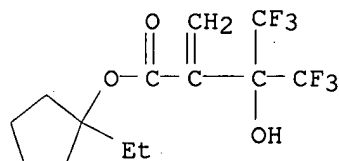
RN 415683-21-5 HCAPLUS

CN Butanoic acid, 4,4,4-trifluoro-3-hydroxy-2-methylene-3-(trifluoromethyl)-, 1-ethylcyclopentyl ester, polymer with tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 415683-20-4

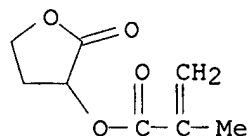
CMF C13 H16 F6 O3



CM 2

CRN 195000-66-9

CMF C8 H10 O4

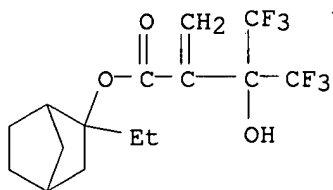


RN 415683-23-7 HCAPLUS

CN Butanoic acid, 4,4,4-trifluoro-3-hydroxy-2-methylene-3-(trifluoromethyl)-, 2-ethylbicyclo[2.2.1]hept-2-yl ester, polymer with tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

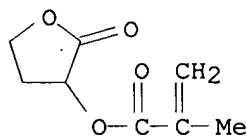
CM 1

CRN 415683-22-6  
CMF C15 H18 F6 O3



CM 2

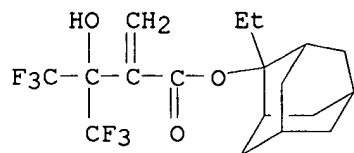
CRN 195000-66-9  
CMF C8 H10 O4



RN 415683-25-9 HCAPLUS  
CN Butanoic acid, 4,4,4-trifluoro-3-hydroxy-2-methylene-3-(trifluoromethyl)-, 2-ethyltricyclo[3.3.1.1.3]dec-2-yl ester, polymer with tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

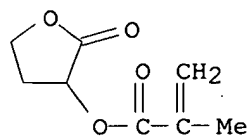
CM 1

CRN 415683-24-8  
CMF C18 H22 F6 O3



CM 2

CRN 195000-66-9  
CMF C8 H10 O4





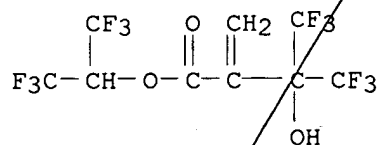
RN 415683-33-9 HCAPLUS

CN Butanoic acid, 4,4,4-trifluoro-3-hydroxy-2-methylene-3-(trifluoromethyl)-, 2,2,2-trifluoro-1-(trifluoromethyl)ethyl ester, polymer with 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 415683-29-3

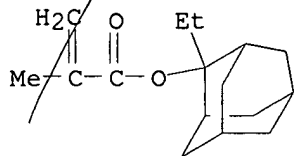
CMF C9 H4 F12 O3



CM 2

CRN 209982-56-9

CMF C16 H24 O2



L44 ANSWER 18 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:11007 HCAPLUS

DN 136:77262

TI Resist composition and patterning process

IN Nishi, Tsunehiro; Kinsho, Takeshi; Nagura, Shigehiro; Kobayashi, Tomohiro; Watanabe, Satoshi

PA Shin-Etsu Chemical Co., Ltd., Japan

SO U.S. Pat. Appl. Publ., 67 pp.

CODEN: USXXCO

DT Patent

LA English

IC ICM G03F007-039

ICS G03F007-38; G03F007-40

NCL 430270100

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 35, 38, 76

FAN.CNT 1

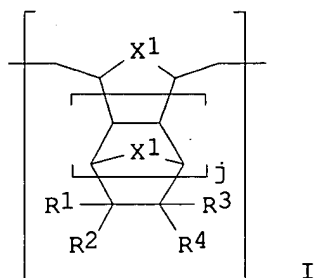
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002001772	A1	20020103	US 2001-832919	20010412
	US 6605408	B2	20030812		

JP 2002202609  
 PRAI JP 2000-111545  
 JP 2000-330181

A2 20020719  
 A 20000413  
 A 20001030

JP 2001-113351 20010412

GI



AB A hydrogenated product of a ring-opening metathesis polymer comprises structural units I (R1-4 = H, functional group having tertiary ester group of cyclic alkyl, C1-20 cyclic haloalkyl, cyclic alkoxy, C2-20 cyclic alkoxyalkyl, cyclic alkylcarbonyloxy, C6-20 arylcarbonyloxy, arylsulfonyloxy, etc.; X1 = -O-, -CR72- (R7 = H, C1-10 alkyl); j = 1-3). The metathesis polymer has improved heat resistance, pyrolysis resistance and light transmission and is suited as a photoresist for semiconductor microfabrication using UV or deep-UV. A resist compn. comprising the polymer as a base resin is sensitive to high-energy radiation and has excellent sensitivity, resolu., and etching resistance.

ST photoresist photolithog hydrogenated ring opening metathesis resin

IT Photolithography

(UV; ring-opening metathesis resin for)

IT Polymerization

(metathetic, ring-opening, hydrogenated; photoresist compn. and patterning process contg.)

IT Photoresists

(ring-opening metathesis resin for)

IT **368872-75-7DP**, hydrogenated

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(prepn. of metathesis resin for **photoresist** compn. and **patterning** process)

IT 24057-28-1DP, reaction product with hydroxy contained polymer

**368872-74-6DP**, hydrogenated **368872-75-7DP**, hydrogenated

**368872-75-7DP**, hydrogenated, partially ester-decompd., partially

esterified with toluenesulfonic acid pyridine salt **368872-76-8DP**

, hydrogenated **368872-76-8DP**, hydrogenated, partially

ester-decompd. **368872-77-9DP**, hydrogenated **368872-77-9DP**

, hydrogenated, partially ester-decompd. **368872-78-0DP**, hydrogenated

**368872-79-1DP**, hydrogenated **368872-80-4DP**, hydrogenated

**368872-84-8DP**, hydrogenated **368872-85-9DP**, hydrogenated

**368872-87-1DP**, hydrogenated **368872-88-2DP**, hydrogenated

**368872-90-6DP**, hydrogenated **385444-02-0DP**, hydrogenated

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(prepn. of ring-opening metathesis resin for **photoresist** compn. and **patterning** process)

IT **368872-75-7DP**, hydrogenated

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(prepn. of metathesis resin for **photoresist** compn. and **patterning** process)

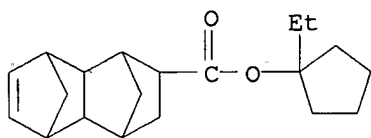
RN 368872-75-7 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-, 1-ethylcyclopentyl ester, polymer with 3a,4,7,7a-tetrahydro-4,7-epoxyisobenzofuran-1(3H)-one (9CI) (CA INDEX NAME)

CM 1

CRN 279243-82-2

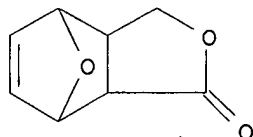
CMF C20 H28 O2



CM 2

CRN 72150-22-2

CMF C8 H8 O3



IT 368872-76-8DP, hydrogenated 368872-77-9DP, hydrogenated

368872-84-8DP, hydrogenated 368872-87-1DP, hydrogenated

368872-88-2DP, hydrogenated 368872-90-6DP, hydrogenated

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(prepn. of ring-opening metathesis resin for **photoresist** compn. and **patterning** process)

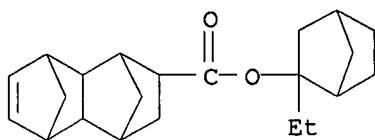
RN 368872-76-8 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-, 2-ethylbicyclo[2.2.1]hept-2-yl ester, polymer with 3a,4,7,7a-tetrahydro-3,3-dimethyl-4,7-epoxyisobenzofuran-1(3H)-one (9CI) (CA INDEX NAME)

CM 1

CRN 336620-41-8

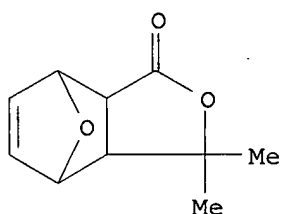
CMF C22 H30 O2



CM 2

CRN 72081-02-8

CMF C10 H12 O3



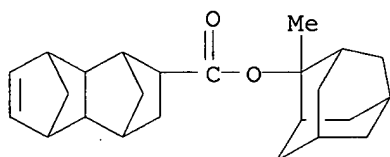
RN 368872-77-9 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with 3a,4,7,7a-tetrahydro-3-methyl-4,7-epoxyisobenzofuran-1(3H)-one (9CI) (CA INDEX NAME)

CM 1

CRN 335626-89-6

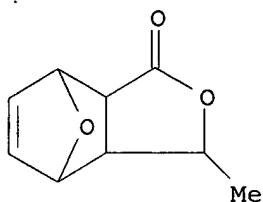
CMF C24 H32 O2



CM 2

CRN 72757-64-3

CMFC9H10O3



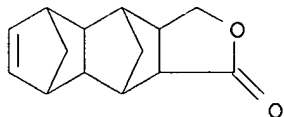
RN 368872-84-8 HCAPLUS

CN 7-Oxabicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-ethylcyclopentyl ester, polymer with 3a,4,4a,5,8,8a,9,9a-octahydro-4,9:5,8-dimethanonaphtho[2,3-c]furan-1(3H)-one (9CI) (CA INDEX NAME)

CM 1

CRN 368872-83-7

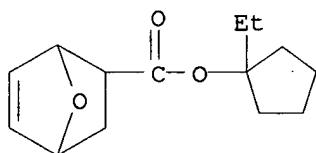
CMF C14 H16 O2



CM 2

CRN 368872-81-5

CMF C14 H20 O3



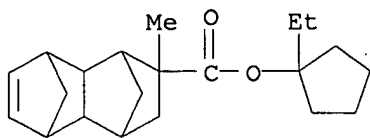
RN 368872-87-1 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-2-methyl-, 1-ethylcyclopentyl ester, polymer with 3a,4,7,7a-tetrahydro-4,7-epoxyisobenzofuran-1(3H)-one (9CI) (CA INDEX NAME)

CM 1

CRN 368872-86-0

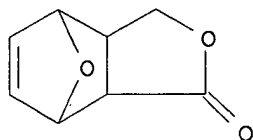
CMF C21 H30 O2



CM 2

CRN 72150-22-2

CMF C8 H8 O3



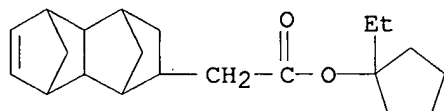
RN 368872-88-2 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-acetic acid, 1,2,3,4,4a,5,8,8a-octahydro-,  
1-ethylcyclopentyl ester, polymer with 3a,4,7,7a-tetrahydro-4,7-  
epoxyisobenzofuran-1(3H)-one (9CI) (CA INDEX NAME)

CM 1

CRN 336617-43-7

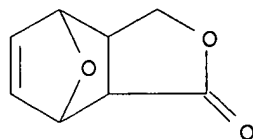
CMF C21 H30 O2



CM 2

CRN 72150-22-2

CMF C8 H8 O3



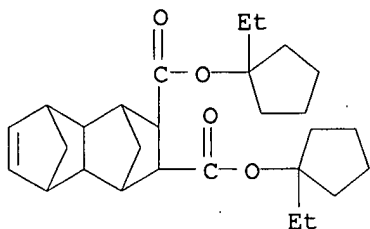
RN 368872-90-6 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2,3-dicarboxylic acid, 1,2,3,4,4a,5,8,8a-  
octahydro-, bis(1-ethylcyclopentyl) ester, polymer with  
3a,4,7,7a-tetrahydro-3,3-dimethyl-4,7-epoxyisobenzofuran-1(3H)-one (9CI)  
(CA INDEX NAME)

CM 1

CRN 368872-89-3

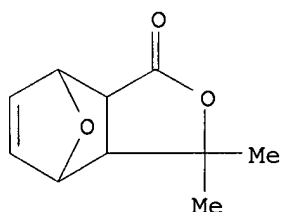
CMF C28 H40 O4



CM 2

CRN 72081-02-8

CMF C10 H12 O3



L44 ANSWER 19 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:796274 HCAPLUS

DN 135:336914

TI Ester compounds, polymers, resist compositions and patterning process

IN Hasegawa, Koji; Nishi, Tsunehiro; Kinsho, Takeshi; Watanabe, Takeru; Nakashima, Mutsuo; Tachibana, Seiichiro; Hatakeyama, Jun

PA Shin-Etsu Chemical Co., Ltd., Japan

SO Eur. Pat. Appl., 45 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM C07C069-716

ICS G03F007-039; C08F020-16; C07C067-14; C07C067-31

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

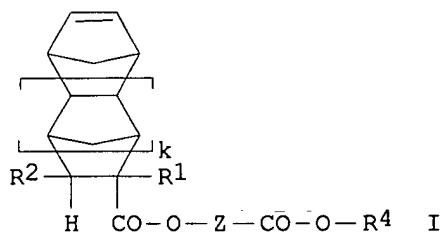
Section cross-reference(s): 35, 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1149825	A2	20011031	EP 2001-303867	20010427
	EP 1149825	A3	20030326		

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

JP 2002012622 A2 20020115 JP 2001-124005 20010423  
 US 2002007031 A1 20020117 US 2001-842007 20010426  
 US 6531627 B2 20030311  
 US 2003088115 A1 20030508 US 2002-288514 20021106  
 PRAI JP 2000-127532 A 20000427  
 US 2001-842007 A3 20010426  
 OS MARPAT 135:336914  
 GI



AB The present invention provides an ester compd. of formula I (R1 = H, Me or CH2CO2R3; R2 = H, Me or CO2R3; R3 = C1-15 alkyl, R4 = branched or cyclic, tertiary C5-20 alkyl group; Z = divalent C1-10 hydrocarbon group; and k = 0 or 1). A photoresist compn. comprising as the base resin a polymer resulting from the ester compd. is sensitive to high-energy radiation, has excellent sensitivity, resolu., and etching resistance, and is suited for micropatterning using electron beams or deep-UV.

ST photoresist ester resin patterning

IT Photolithography

(UV; patterning of photoresists from ester compds. and polymers)

IT Photoresists

(prepn. of ester compd. and polymers for photoresist compns. and patterning process)

IT 75-07-0, Acetaldehyde, reactions 27063-48-5 370088-86-1

RL: RCT (Reactant); RACT (Reactant or reagent)

(prepn. of ester compd. and polymers for photoresist compns. and patterning process)

IT 370088-87-2P 370088-88-3P 370088-89-4P 370088-90-7P 370088-91-8P  
 370088-92-9P 370088-93-0P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. of ester compd. and polymers for photoresist compns. and patterning process)

IT 370088-94-1P 370088-95-2P 370088-96-3P 370088-97-4P 370088-98-5P  
 370088-99-6P 370089-00-2P 370089-01-3P 370089-02-4P

**370089-04-6P 370089-05-7P 370089-06-8P**

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(prepn. of ester compd. and polymers for **photoresist** compns. and **patterning** process)

IT **370089-04-6P 370089-05-7P 370089-06-8P**

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(prepn. of ester compd. and polymers for **photoresist** compns. and **patterning** process)

RN 370089-04-6 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 3-[(1-ethylcyclopentyl)oxy]-1-

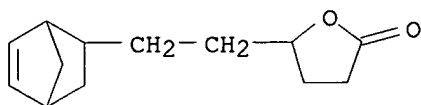


methyl-3-oxopropyl ester, polymer with 5-(2-bicyclo[2.2.1]hept-5-en-2-ylethyl) dihydro-2(3H)-furanone (9CI) (CA INDEX NAME)

CM 1

CRN 370089-03-5

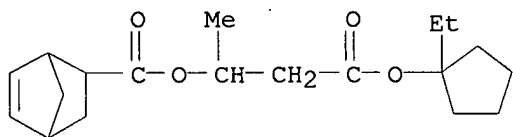
CMF C13 H18 O2



CM 2

CRN 370088-90-7

CMF C19 H28 O4



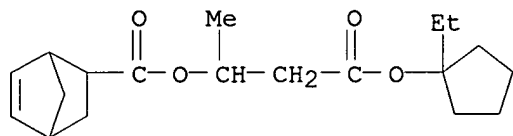
RN 370089-05-7 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 3-[(1-ethylcyclopentyl)oxy]-1-methyl-3-oxopropyl ester, polymer with 2-(2-methoxyethoxy)ethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 370088-90-7

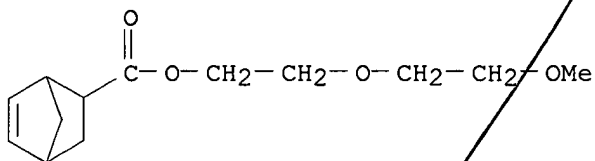
CMF C19 H28 O4



CM 2

CRN 295328-74-4

CMF C13 H20 O4



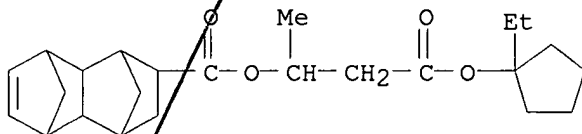
RN 370089-06-8 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-, 3-[(1-ethylcyclopentyl)oxy]-1-methyl-3-oxopropyl ester, polymer with 3a,4,7,7a-tetrahydro-4,7-methanoisobenzofuran-1(3H)-one (9CI)  
(CA INDEX NAME)

CM 1

CRN 370088-93-0

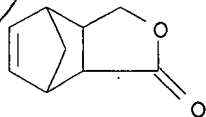
CMF C24 H34 O4



CM 2

CRN 85718-44-1

CMF C9 H10 O2



L44 ANSWER 20 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:780440 HCAPLUS

DN 135:304984

TI Polymers of ester compounds for resist compositions and patterning

IN Hasegawa, Koji; Nishi, Tsunehiro; Kinsho, Takeshi; Watanabe, Takeru;  
Nakashima, Mutsuo; Tachibana, Seiichiro; Hatakeyama, Jun

PA Shin-Etsu Chemical Co., Ltd., Japan

SO Eur. Pat. Appl., 49 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM C07C069-753

ICS G03F007-039; C08F020-16; C07C069-013

CC 38-3 (Plastics Fabrication and Uses)

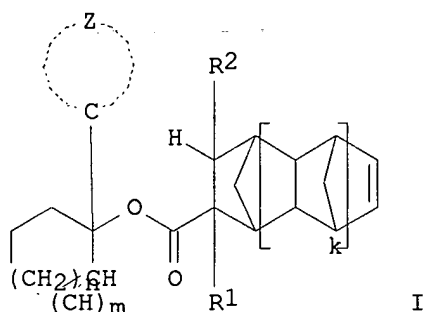
FAN.CNT 2

PATENT NO.

KIND DATE

APPLICATION NO. DATE

PI	EP 1148045	A1	20011024	EP 2001-303555	20010419
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2002003537	A2	20020109	JP 2001-115209	20010413
	JP 2002030114	A2	20020131	JP 2001-115142	20010413
	US 2001044071	A1	20011122	US 2001-837378	20010419
	US 6586157	B2	20030701		
	US 2002004178	A1	20020110	US 2001-837219	20010419
	US 6596463	B2	20030722		
	TW 507117	B	20021021	TW 2001-90109382	20010419
PRAI	JP 2000-119410	A	20000420		
OS	MARPAT 135:304984				
GI					



AB An ester compd. of the following formula I, which is sensitive to high-energy radiation, has excellent sensitivity, resoln., and etching resistance, and is suited for micropatterning using electron beams or deep-UV., is provided, wherein R1 is H, Me or CH2CO2R3, R2 is H, Me or CO2R3, R3 is C1-C15 alkyl, k is 0 or 1, Z is a divalent C2-C20 hydrocarbon group which forms a single ring or bridged ring with the carbon atom and which may contain a hetero atom, m is 0 or 1, n is 0, 1, 2 or 3, and 2m+n = 2 or 3.

ST ester polymer photoresist patterning

IT Photoresists

(polymers of ester compds. for photoresist and patterning)

IT 16189-57-4P, 1-Cyclohexylcyclopentanol 367250-28-0P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(polymers of ester compds. for photoresist and patterning)

IT 195154-83-7P 210040-16-7P 367250-29-1P 367250-31-5P 367250-33-7P

367250-35-9P 367250-37-1P 367250-39-3P 367250-41-7P 367250-42-8P

367250-43-9P 367250-45-1P **367250-46-2P** 367250-47-3P

**367250-48-4P 367250-49-5P 367250-50-8P**

**367250-52-0P 367250-53-1P**

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polymers of ester compds. for **photoresist** and **patterning**)

IT 120-92-3, Cyclopentanone 542-18-7, Chlorocyclohexane 542-92-7, Cyclopentadiene, reactions 814-68-6, 2-Propenoyl chloride

RL: RCT (Reactant); RACT (Reactant or reagent)

(polymers of ester compds. for photoresist and patterning)

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

- (1) Hyundai Electronics Industries Co Ltd; DE 19940515 A 2000 HCAPLUS  
(2) Takeru, W; US 6147249 A 2000 HCAPLUS

IT 367250-46-2P 367250-48-4P 367250-49-5P  
367250-50-8P 367250-52-0P 367250-53-1P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(polymers of ester compds. for photoresist and patterning)

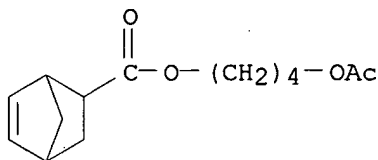
RN 367250-46-2 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 4-(acetyloxy)butyl ester, polymer with 1-cyclohexylcyclopentyl bicyclo[2.2.1]hept-5-ene-2-carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 367250-44-0

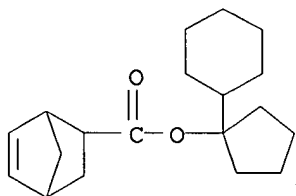
CMF C14 H20 O4



CM 2

CRN 367250-28-0

CMF C19 H28 O2



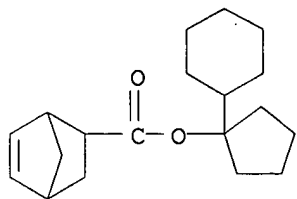
RN 367250-48-4 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-cyclohexylcyclopentyl ester, polymer with 2-(2-methoxyethoxy)ethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 367250-28-0

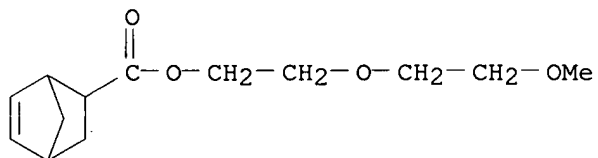
CMF C19 H28 O2



CM 2

CRN 295328-74-4

CMF C13 H20 O4



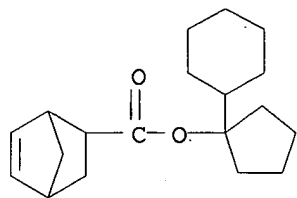
RN 367250-49-5 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-cyclohexylcyclopentyl ester,  
polymer with spiro[bicyclo[2.2.1]hept-5-ene-2,3' (2'H)-furan]-5' (4'H)-one  
(9CI) (CA INDEX NAME)

CM 1

CRN 367250-28-0

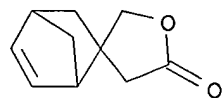
CMF C19 H28 O2



CM 2

CRN 282542-79-4

CMF C10 H12 O2



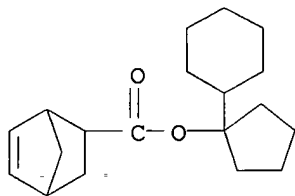
RN 367250-50-8 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-cyclohexylcyclopentyl ester,  
polymer with 3a,4,7,7a-tetrahydro-4,7-methanoisobenzofuran-1(3H)-one (9CI)  
(CA INDEX NAME)

CM 1

CRN 367250-28-0

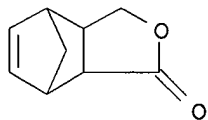
CMF C19 H28 O2



CM 2

CRN 85718-44-1

CMF C9 H10 O2



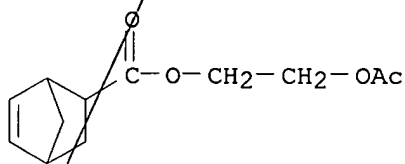
RN 367250-52-0 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-(acetyloxy)ethyl ester,  
polymer with 1-cyclohexylcyclopentyl bicyclo[2.2.1]hept-5-ene-2-  
carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 367250-51-9

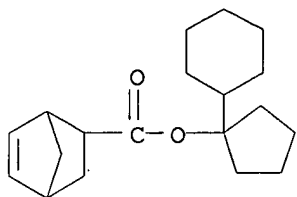
CMF C12 H16 O4



CM 2

CRN 367250-28-0

CMF C19 H28 O2



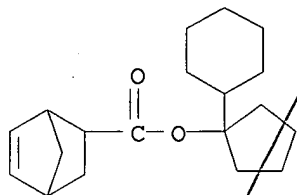
RN 367250-53-1 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-cyclohexylcyclopentyl ester,  
polymer with 2-methoxyethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate (9CI)  
(CA INDEX NAME)

CM 1

CRN 367250-28-0

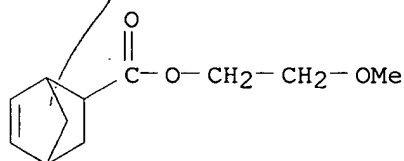
CMF C19 H28 O2



CM 2

CRN 46276-02-2

CMF C11 H16 O3



L44 ANSWER 21 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:780439 HCAPLUS

DN 135:304286

TI polymers of ester compounds for resist compositions and patterning

IN Hasegawa, Koji; Nishi, Tsunehiro; Kinsho, Takeshi; Watanabe, Takeru;  
Nakashima, Mutsuo; Tachibana, Seiichiro; Hatakeyama, Jun

PA Shin-Etsu Chemical Co., Ltd., Japan

SO Eur. Pat. Appl., 38 pp.

CODEN: EPXXDW

DT Patent

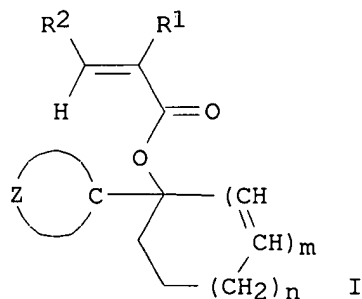
LA English

IC ICM C07C069-54

ICS C07C069-013; C08F020-18; G03F007-039  
 CC 35-4 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 74

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1148044	A1	20011024	EP 2001-303574	20010419
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2002003537	A2	20020109	JP 2001-115209	20010413
	JP 2002030114	A2	20020131	JP 2001-115142	20010413
	US 2001044071	A1	20011122	US 2001-837378	20010419
	US 6586157	B2	20030701		
	US 2002004178	A1	20020110	US 2001-837219	20010419
	US 6596463	B2	20030722		
	TW 507117	B	20021021	TW 2001-90109382	20010419
PRAI	JP 2000-119410	A	20000420		
OS	MARPAT 135:304286				
GI					



AB An ester compd. of the following formula (I) is provided wherein R1 is H, Me or CH<sub>2</sub>CO<sub>2</sub>R<sub>3</sub>, R<sub>3</sub> is H, Me or CO<sub>2</sub>R<sub>3</sub>, R<sub>3</sub> is C1-C15 alkyl, Z is a divalent C2-C20 hydrocarbon group which forms a single ring or bridged ring with the carbon atom and which may contain a hetero atom, m is 0 or 1, n is 0, 1, 2 or 3, and 2m+n = 2 or 3. Thus, 1-cyclohexylcyclopentyl acrylate 66.6, 2-oxoxolan-3-yl 2-norbornene-5-carboxylate 77.7 and maleic anhydride 34.3 g were polymd. to give a polymer at yield 45.3% as photoresist, showing resoln. 0.16 nm.

ST ester polymer photoresist patterning

IT Photoresists

(polymers of ester compds. for photoresist and patterning)

IT 108-94-1, Cyclohexanone, reactions 542-18-7, Chlorocyclohexane

RL: RCT (Reactant); RACT (Reactant or reagent)

(in prepn. of monomer; polymers of ester compds. for photoresist and patterning)

IT 366808-81-3P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(monomer; polymers of ester compds. for photoresist and patterning)

IT 16189-57-4P, 1-Cyclohexyl-cyclopentanol

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(polymers of ester compds. for photoresist and patterning)

IT 195000-69-2P 366808-82-4P 366808-88-0P 366808-91-5P



366808-94-8P 366808-95-9P 366808-97-1P **366809-00-9P**  
**366809-03-2P** 366809-05-4P 366809-06-5P 366809-07-6P  
366809-09-8P 366809-10-1P 366809-11-2P 366809-13-4P

RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(polymers of ester compds. for **photoresist** and **patterning**)

IT 814-68-6, 2-Propenoyl chloride

RL: RCT (Reactant); RACT (Reactant or reagent)

(polymers of ester compds. for photoresist and patterning)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Daichel Chemical Industries Ltd; WO 9961401 A 1999 HCAPLUS

(2) Daichel Chemical Industries Ltd; EP 1000924 A 2000 HCAPLUS

(3) Shin-Etsu Chemical Co Ltd; EP 1004568 A 2000 HCAPLUS

IT **195000-69-2P 366809-00-9P 366809-03-2P**

RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(polymers of ester compds. for **photoresist** and **patterning**)

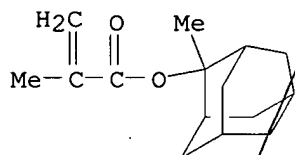
RN 195000-69-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with tetrahydro-5-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 177080-67-0

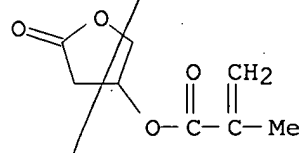
CMF C15 H22 O2



CM 2

CRN 180224-95-2

CMF C8 H10 O4



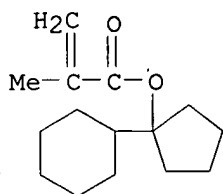
RN 366809-00-9 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-cyclohexylcyclopentyl ester, polymer with hexahydro-2-oxo-3,5-methano-2H-cyclopenta[b]furan-6-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 366808-98-2

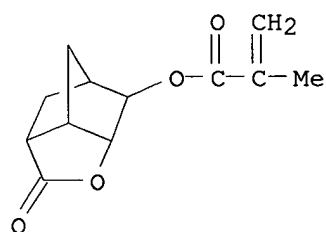
CMF C15 H24 O2



CM 2

CRN 254900-07-7

CMF C12 H14 O4



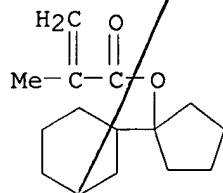
RN 366809-03-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-cyclohexylcyclopentyl ester, polymer with tetrahydro-5-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 366808-98-2

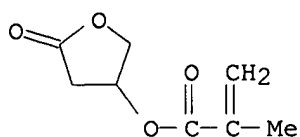
CMF C15 H24 O2



CM 2

CRN 130224-95-2

CMF C8 H10 O4



L44 ANSWER 22 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:738610 HCAPLUS

DN 135:310916

TI Method and material for reducing positive-working chemical amplification-type resist pattern size

IN Shima, Motoyuki; Sugimoto, Takeshi

PA Jsr Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G03F007-40

ICS G03F007-039; H01L021-027

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 35, 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001281886	A2	20011010	JP 2000-98586	20000331
PRAI	JP 2000-98586		20000331		

AB The invention relates to the redn. of a line width of a pos.-working chem. amplification-type photoresists pattern by applying an acidic resist pattern-reducing material based on a water-sol. resin on the resist pattern. The process is able to form a line width which surpasses the limits of an exposure device and a wavelength.

ST photoresist redn resin

IT Photoresists

(redn. of pos.-working chem. amplification-type photoresists pattern)

IT 27119-07-9P, 2-Acrylamido-2-methylpropanesulfonic acid homopolymer  
**110226-65-8P**, Acrylic acid-2,2,2-trifluoroethyl acrylate copolymer  
 366008-91-5P, 2-Acrylamido-2-methylpropanesulfonic acid-2,2,2-trifluoroethyl acrylate copolymer

RL: PEP (Physical, engineering or chemical process); **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; PROC (Process); USES (Uses)

(redn. of pos.-working chem. amplification-type **photoresists pattern**)

IT 9002-89-5, Polyvinyl alcohol 9003-39-8, Polyvinylpyrrolidone

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(redn. of pos.-working chem. amplification-type photoresists pattern)

IT 335-67-1, Perfluorooctanoic acid 1763-23-1, Perfluorooctanesulfonic acid

RL: TEM (Technical or engineered material use); USES (Uses)

(surfactant; redn. of pos.-working chem. amplification-type photoresists pattern)

IT **110226-65-8P**, Acrylic acid-2,2,2-trifluoroethyl acrylate copolymer

RL: PEP (Physical, engineering or chemical process); **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; PROC (Process); USES (Uses)

(redn. of pos.-working chem. amplification-type photoresists  
pattern)

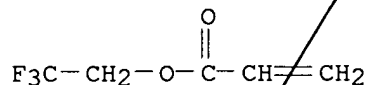
RN 110226-65-8 HCAPLUS

CN 2-Propenoic acid, polymer with 2,2,2-trifluoroethyl 2-propenoate (9CI)  
(CA INDEX NAME)

CM 1

CRN 407-47-6

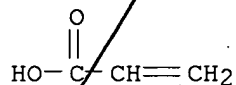
CMF C5 H5 F3 O2



CM 2

CRN 79-10-7

CMF C3 H4 O2



L44 ANSWER 23 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:738323 HCAPLUS

DN 135:296188

TI Silicon-containing polymer, chemically amplified positively working photoresist composition, and patterning of photoresist

IN Hatakeyama, Jun; Watanabe, Takeshi; Hasegawa, Koji; Kaneo, Takeshi

PA Shin-Etsu Chemical Industry Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 22 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08F030-08

ICS C08F032-00; C08K005-00; C08L043-04; C08L045-00; G03F007-039;  
G03F007-075; G03F007-40; H01L021-027

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 38, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001278918	A2	20011010	JP 2000-95990	20000331
PRAI	JP 2000-95990		20000331		

AB The polymer with wt. av. mol. wt. (Mw) 2000-1,000,000 is that having R3R4R5SiCH2R1R2C, (R3R4R5SiCH2)2R1C, and/or (R3R4R5SiCH2)3C (R1, R2 = H, C1-20 alkyl; R3-R5 = C1-20 alkyl, haloalkyl, C6-20 aryl, group involving SiO). A polymer with Mw 100-2000 having carboxylic acid-type OH, alc. OH, and/or phenolic OH and the above Si-contg. substituents as a dissoln.

regulator is also claimed. The chem. amplified pos. working photoresist compn. contains the polymer, an acid-generating agent, an org. solvent or contains a polymer substituted with groups unstable in acidic conditions, an acid-generating agent, an org. solvent, and the dissoln. regulator. The compn. is applied on an org. film on a substrate, baked to form a resist film, patternwise irradiated with radiation, baked, and developed by an aq. alk. soln. to form a resist pattern then the org. film is patterned by O plasma etching through the resist pattern. The photoresist compn. provides precise pattern with high aspect ratio.

ST silicon contg polymer pos working photoresist; chem amplified pos working photoresist; high aspect ratio pos working photoresist

IT Etching

(plasma; silicon-contg. polymer for chem. amplified pos. working photoresist providing pattern with high aspect ratio by)

IT Resists

(radiation-sensitive; silicon-contg. polymer for chem. amplified pos. working photoresist providing pattern with high aspect ratio)

IT Positive photoresists

Semiconductor device fabrication

(silicon-contg. polymer for chem. amplified pos. working photoresist providing pattern with high aspect ratio)

IT 66003-76-7 66003-78-9

RL: MOA (Modifier or additive use); USES (Uses)

(acid-generating agent; in chem. amplified pos. working photoresist contg. silicon-contg. polymer)

IT 364614-69-7 364614-70-0

RL: MOA (Modifier or additive use); USES (Uses)

(dissoln. regulator; in chem. amplified pos. working photoresist contg. silicon-contg. polymer)

IT 102-82-9, Tributylamine 211919-60-7

RL: MOA (Modifier or additive use); USES (Uses)

(in chem. amplified pos. working photoresist contg. silicon-contg. polymer)

IT **364614-62-0P 364614-64-2P 364614-66-4P**

364614-68-6P

RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(silicon-contg. polymer for chem. amplified pos. working photoresist providing pattern with high aspect ratio)

IT **364614-62-0P 364614-64-2P 364614-66-4P**

RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(silicon-contg. polymer for chem. amplified pos. working photoresist providing pattern with high aspect ratio)

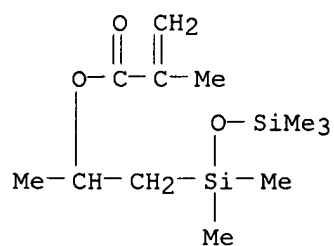
RN 364614-62-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-methyl-2-(pentamethyldisiloxanyl)ethyl ester, polymer with tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI)  
(CA INDEX NAME)

CM 1

CRN 364614-61-9

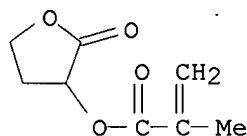
CMF C12 H26 O3 Si2



CM 2

CRN 195000-66-9

CMF C8 H10 O4



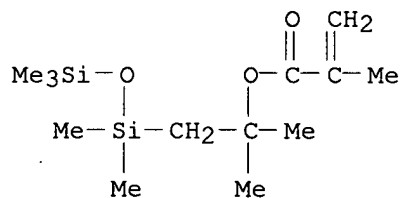
RN 364614-64-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1,1-dimethyl-2-(pentamethyldisiloxanyl)ethyl  
 ester, polymer with tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI)  
 (CA INDEX NAME)

CM 1

CRN 364614-63-1

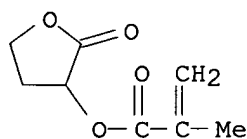
CMF C13 H28 O3 Si2



CM 2

CRN 195000-66-9

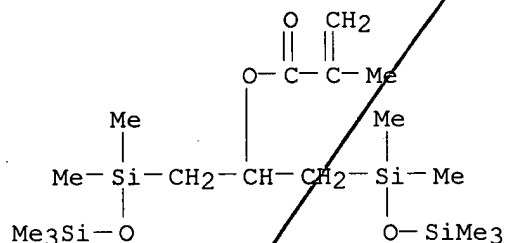
CMF C8 H10 O4



RN 364614-66-4 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, 2-(pentamethyldisiloxanyl)-1-  
 [(pentamethyldisiloxanyl)methyl]ethyl ester, polymer with  
 tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

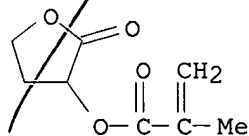
CM 1

CRN 364614-65-3  
 CMF C17 H40 O4 Si4



CM 2

CRN 195000-66-9  
 CMF C8 H10 O4



L44 ANSWER 24 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:242861 HCAPLUS  
 DN 134:287856  
 TI Method for negative-working photoresist pattern formation using light  
 sensitive composition containing polymer with ethyloxy acrylate repeating  
 unit  
 IN Angelopoulos, Marie; Babich, Edward D.; Babich, Inna V.; Babich, Katelina  
 E.; Bucchignano, James J.; Petrillo, Karen E.; Liston, Steven Anthony  
 PA International Business Machines Corp., USA  
 SO Jpn. Kokai Tokkyo Koho, 12 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM G03F007-033  
 ICS C08F020-26; G03F007-075; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 FAN.CNT 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 2001092135 A2 20010406 JP 2000-239755 20000808  
 US 6251569 B1 20010626 US 1999-373555 19990813  
 PRAI US 1999-373555 A 19990813

AB The title method includes the steps of: forming a neg.-working photoresist layer contg. polymer with repeating unit  $[-CH_2-C(R)(COO-CH_2CH_2OR')]_n$  (R = alkyl,  $CH_2Si(CH_3)_3$ ; R' =  $-(CH_2CH_2O)mR_n$ , alkyl, cycloalkyl, aryl; m 1-10 integer; n = 5-10,000 integer); imagewise exposing the resist layer; and removing unexposed area from the resist layer. The method, which uses the light-sensitive compn. contg. the polymer with ethyloxy acrylate repeating unit, provides the high resoln. pattern developable in aq. soln.

ST neg working photoresist polymer ethyloxy acrylate repeating unit

IT Light-sensitive materials

(method for neg.-working photoresist pattern formation using light sensitive compn. contg. polymer with ethyloxy acrylate repeating unit)

IT Photoresists

(polymer in light sensitive compn. for neg.-working photoresist pattern formation)

IT 65744-44-7P, 2-(2-Methoxyethoxy)ethyl acrylate homopolymer 332936-77-3P, 2-(2-Methoxyethoxy)ethyl acrylate-Tetrahydro-3-furyl methacrylate-4-Methacryloyloxyethyl trimellitic anhydride copolymer **332936-79-5P**, 2-(2-Methoxyethoxy)ethyl acrylate-methacrylic acid copolymer 332936-81-9P, 2-(2-Methoxyethoxy)ethyl acrylate-2-Acrylamido-2-methyl-1-propanesulfonic acid copolymer 332936-83-1P, 2-(2-Methoxyethoxy)ethyl acrylate-4-Methacryloyloxyethyl trimellitic anhydride-dicyclopentenyl methacrylate copolymer **332936-85-3P**, 2-(2-Methoxyethoxy)ethyl acrylate-p-hydroxystyrene copolymer **332936-87-5P**, 2-(2-Methoxyethoxy)ethyl acrylate-styrene copolymer **332936-89-7P**, 2-(2-Methoxyethoxy)ethyl acrylate-p-Acetoxystyrene copolymer 332936-91-1P, 2-(2-Methoxyethoxy)ethyl acrylate-N-(p-Hydroxyphenyl)methacrylamide copolymer **332936-93-3P**, 2-(2-Methoxyethoxy)ethyl acrylate-2-bromoethyl methacrylate copolymer **332936-95-5P**, 2-(2-Methoxyethoxy)ethyl acrylate-1-Adamantyl acrylate copolymer 332936-97-7P, 2-(2-Methoxyethoxy)ethyl acrylate-Norbornene-maleic anhydride-methacrylic acid copolymer **332936-99-9P**, 2-(2-Methoxyethoxy)ethyl acrylate-3-[Tris(trimethylsiloxy)silyl]propyl methacrylate copolymer **332937-01-6P**, 2-(2-Methoxyethoxy)ethyl acrylate-4-Methacryloyloxyethyl trimellitic anhydride copolymer  
 RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(polymer in light sensitive compn. for neg.-working photoresist pattern formation)

IT **332936-79-5P**, 2-(2-Methoxyethoxy)ethyl acrylate-methacrylic acid copolymer **332936-85-3P**, 2-(2-Methoxyethoxy)ethyl acrylate-p-hydroxystyrene copolymer **332936-87-5P**, 2-(2-Methoxyethoxy)ethyl acrylate-styrene copolymer **332936-89-7P**, 2-(2-Methoxyethoxy)ethyl acrylate-p-Acetoxystyrene copolymer **332936-93-3P**, 2-(2-Methoxyethoxy)ethyl acrylate-2-bromoethyl methacrylate copolymer **332936-95-5P**, 2-(2-Methoxyethoxy)ethyl acrylate-1-Adamantyl acrylate copolymer **332936-99-9P**, 2-(2-Methoxyethoxy)ethyl acrylate-3-[Tris(trimethylsiloxy)silyl]propyl methacrylate copolymer **332937-01-6P**, 2-(2-Methoxyethoxy)ethyl acrylate-4-Methacryloyloxyethyl trimellitic anhydride copolymer  
 RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(polymer in light sensitive compn. for neg.-working photoresist pattern formation)

RN 332936-79-5 HCAPLUS

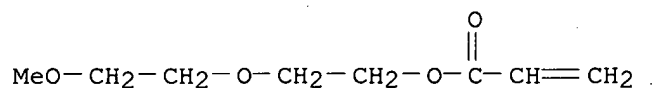


CN 2-Propenoic acid, 2-methyl-, polymer with 2-(2-methoxyethoxy)ethyl  
2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 7328-18-9

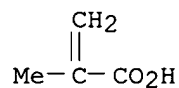
CMF C8 H14 O4



CM 2

CRN 79-41-4

CMF C4 H6 O2



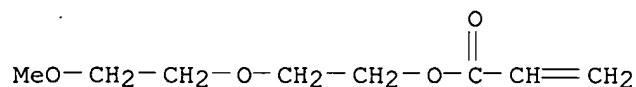
RN 332936-85-3 HCAPLUS

CN 2-Propenoic acid, 2-(2-methoxyethoxy)ethyl ester, polymer with  
4-ethenylphenol (9CI) (CA INDEX NAME)

CM 1

CRN 7328-18-9

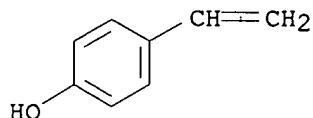
CMF C8 H14 O4



CM 2

CRN 2628-17-3

CMF C8 H8 O



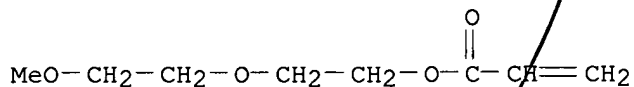
RN 332936-87-5 HCAPLUS

CN 2-Propenoic acid, 2-(2-methoxyethoxy)ethyl ester, polymer with  
ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 7328-18-9

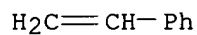
CMF C8 H14 O4



CM 2

CRN 100-42-5

CMF C8 H8



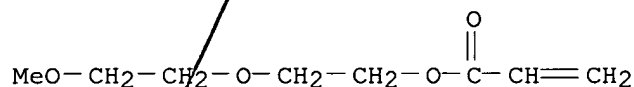
RN 332936-89-7 HCAPLUS

CN 2-Propenoic acid, 2-(2-methoxyethoxy)ethyl ester, polymer with 4-ethenylphenyl acetate (9CI) (CA INDEX NAME)

CM 1

CRN 7328-18-9

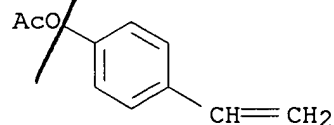
CMF C8 H14 O4



CM 2

CRN 2628-16-2

CMF C10 H10 O2



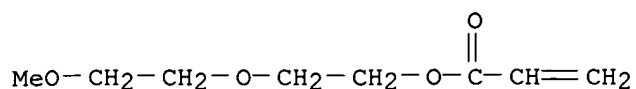
RN 332936-93-3 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-bromoethyl ester, polymer with 2-(2-methoxyethoxy)ethyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 7328-18-9

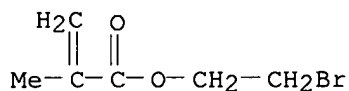
CMF C8 H14 O4



CM 2

CRN 4513-56-8

CMF C6 H9 Br O2



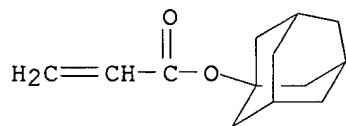
RN 332936-95-5 HCAPLUS

CN 2-Propenoic acid, 2-(2-methoxyethoxy)ethyl ester, polymer with tricyclo[3.3.1.1<sup>3,7</sup>]dec-1-yl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 121601-93-2

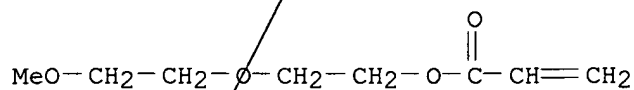
CMF C13 H18 O2



CM 2

CRN 7328-18-9

CMF C8 H14 O4



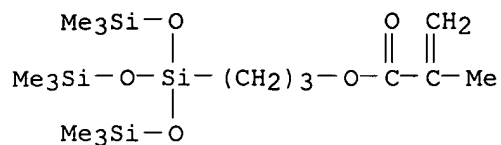
RN 332936-99-9 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 3-[3,3,3-trimethyl-1,1-bis[(trimethylsilyl)oxy]disiloxanyl]propyl ester, polymer with 2-(2-methoxyethoxy)ethyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 17096-07-0

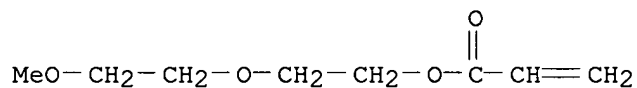
CMF C16 H38 O5 Si4



CM 2

CRN 7328-18-9

CMF C8 H14 O4



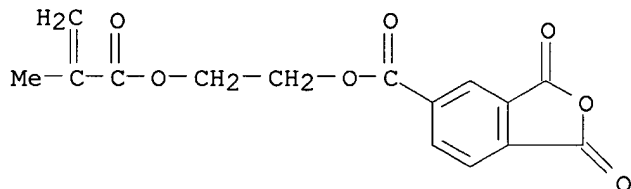
RN 332937-01-6 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl ester, polymer with  
2-(2-methoxyethoxy)ethyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 70293-55-9

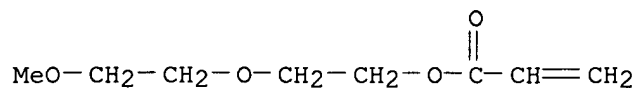
CMF C15 H12 O7



CM 2

CRN 7328-18-9

CMF C8 H14 O4



L44 ANSWER 25 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:98660 HCAPLUS

DN 134:170819

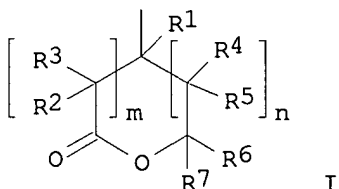
TI Positive-working photoresist composition for exposure to far ultraviolet light

IN Aogo, Toshiaki; Sato, Kenichiro; Kodama, Kunihiro

PA Fuji Photo Film Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 56 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM G03F007-039  
 ICS H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001033971	A2	20010209	JP 1999-207958	19990722
PRAI	JP 1999-207958		19990722		
GI					



AB The title compn. contains (1) a compd. which generates acids by irradiation of actinic ray or radiation and (2) a polymer contg. a repeating unit represented by I [R1 = H, (substituted) C1-4 alkyl; R2-7 = H, (substituted) alkyl, cycloalkyl, or alkenyl, where at least R6 or R7 is group other than H; R6 and R7 may connect to form ring; m, n = 0, 1; m = n.noteq. 0]. The polymer decomps. by acids and increases in alkali soly. The compn. is sensitive to far UV light, esp. to ArF excimer laser light, and resist patterns with low edge roughness and high resolu. can be offered.

ST pos photoresist far UV exposure; edge roughness low resolu high photoresist far UV

IT Positive photoresists

(UV; pos.-working photoresist compn. for exposure to far UV light for formation of pattern with high resolu. and low edge roughness)

IT 14159-45-6 66003-78-9 84563-54-2 153698-46-5 258341-98-9 324771-13-3

RL: TEM (Technical or engineered material use); USES (Uses)

(acid generator; pos.-working photoresist compn. for exposure to far UV light for formation of pattern with high resolu. and low edge roughness)

IT 324770-90-3P 324770-92-5P 324770-94-7P

324770-95-8P 324770-96-9P 324770-98-1P

324770-99-2P 324771-00-8P 324771-01-9P 324771-02-0P

324771-03-1P 324771-06-4P 324771-07-5P 324771-08-6P 324771-10-0P

324771-12-2P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(pos.-working photoresist compn. for exposure to far UV light for formation of pattern with high resolu. and low edge roughness)

IT 324770-90-3P 324770-92-5P 324770-94-7P  
 324770-95-8P 324770-96-9P 324770-98-1P  
 324770-99-2P 324771-00-8P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (pos.-working photoresist compn. for exposure to far UV light for formation of pattern with high resolu. and low edge roughness)

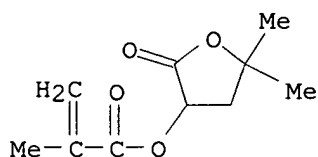
RN 324770-90-3 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with tetrahydro-5,5-dimethyl-2-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 280552-09-2

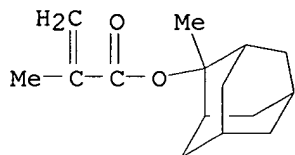
CMF C10 H14 O4



CM 2

CRN 177080-67-0

CMF C15 H22 O2



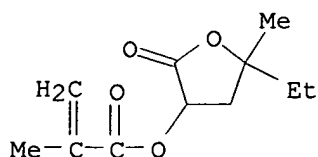
RN 324770-92-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 5-ethyltetrahydro-5-methyl-2-oxo-3-furanyl ester, polymer with 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 324770-91-4

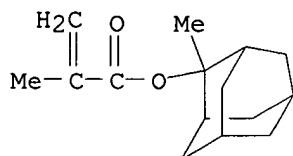
CMF C11 H16 O4



CM 2

CRN 177080-67-0

CMF C15 H22 O2



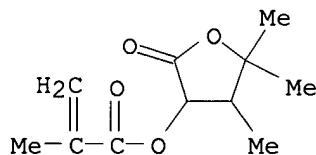
RN 324770-94-7 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
polymer with tetrahydro-4,5,5-trimethyl-2-oxo-3-furanyl  
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 324770-93-6

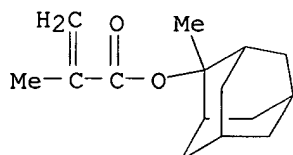
CMF C11 H16 O4



CM 2

CRN 177080-67-0

CMF C15 H22 O2



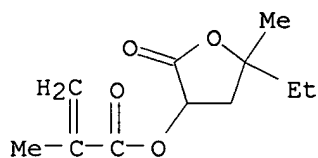
RN 324770-95-8 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 5-ethyltetrahydro-5-methyl-2-oxo-3-furanyl  
ester, polymer with 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl  
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 324770-91-4

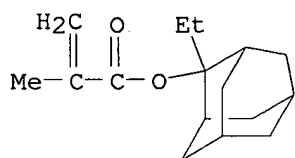
CMF C11 H16 O4



CM 2

CRN 209982-56-9

CMF C16 H24 O2



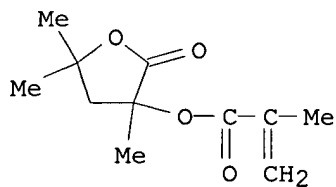
RN 324770-96-9 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
polymer with tetrahydro-3,5,5-trimethyl-2-oxo-3-furanyl  
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 324761-21-9

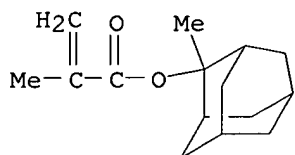
CMF C11 H16 O4



CM 2

CRN 177080-67-0

CMF C15 H22 O2





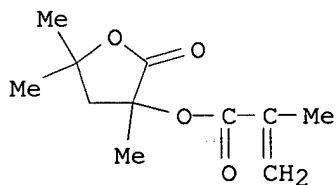
RN 324770-98-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 3-hydroxytricyclo[3.3.1.1<sup>3,7</sup>]dec-1-yl ester,  
polymer with tetrahydro-3,5,5-trimethyl-2-oxo-3-furanyl  
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 324761-21-9

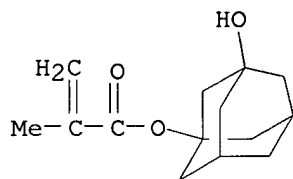
CMF C11 H16 O4



CM 2

CRN 115372-36-6

CMF C14 H20 O3



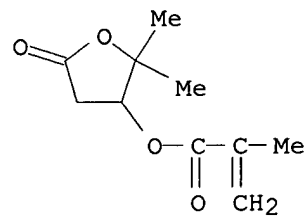
RN 324770-99-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester,  
polymer with tetrahydro-2,2-dimethyl-5-oxo-3-furanyl 2-methyl-2-propenoate  
(9CI) (CA INDEX NAME)

CM 1

CRN 324761-31-1

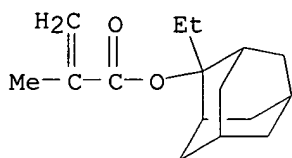
CMF C10 H14 O4



CM 2

CRN 209982-56-9

CMF C16 H24 O2



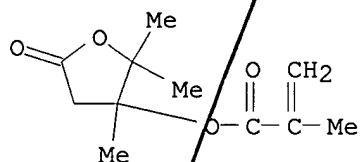
RN 324771-00-8 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.13,7]dec-2-yl ester, polymer with tetrahydro-2,2,3-trimethyl-5-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 324761-27-5

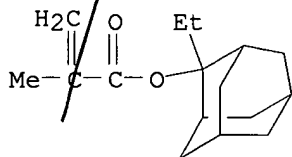
CMF C11 H16 O4



CM 2

CRN 209982-56-9

CMF C16 H24 O2



L44 ANSWER 26 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:274589 HCAPLUS

DN 132:315846

TI Negatively working photoresist composition using polymer with 1,2-diol structure and manufacture of resist pattern using it

IN Iwasa, Shigeyuki; Maeda, Katsumi; Nakano, Kaichiro; Hasegawa, Etsuo

PA NEC Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 23 pp.

CODEN: JKXXAF

DT Patent  
 LA Japanese  
 IC ICM G03F007-038  
 ICS G03F001-08; G03F007-004; G03F007-027; G03F007-029; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 38, 76

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000122288	A2	20000428	JP 1998-288214	19981009
	JP 3237702	B2	20011210		
	US 6146806	A	20001114	US 1999-285730	19990405
	US 6469197	B1	20021022	US 2000-668275	20000925
PRAI	JP 1998-93499	A	19980406		
	JP 1998-288214	A	19981009		
	US 1999-285730	A3	19990405		

OS MARPAT 132:315846

AB The compn. contains polymers having a unit CH<sub>2</sub>CR<sub>1</sub>(CO<sub>2</sub>G) (R<sub>1</sub> = H, Me; G = alicyclic group having 1,2-diol structure), a crosslinking agent having a functional group CON(CH<sub>2</sub>OR<sub>10</sub>) (R<sub>10</sub> = H, C1-6 alkyl, C3-6 oxoalkyl), and a photoacid generator. The resist pattern is manufd. by forming the above resist compn. layer on a substrate, imagewise exposing 180-220-nm light to the substrate, and successively baking and developing it. The compn. gives high-resoln. resit images with good dry-etching resistance to be useful for fabrication of semiconductor devices.

ST alicyclic diol polymer neg photoresist etching resistance; far UV neg resist patterning semiconductor device

IT Photoresists

(UV; patterning of neg.-working photoresist compn. using polymer with 1,2-diol structure)

IT Negative photoresists

(patterning of neg.-working photoresist compn. using polymer with 1,2-diol structure)

IT 4356-60-9 13747-14-3 15968-37-3 17464-88-9 221206-62-8

RL: TEM (Technical or engineered material use); USES (Uses)

(crosslinking agent; patterning of neg.-working photoresist compn. using polymer with 1,2-diol structure)

IT 247262-13-1P 265660-19-3P 265660-20-6P **265660-21-7P**

265660-23-9P 265660-24-0P 265660-25-1P 265660-26-2P

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(**patterning** of neg.-working **photoresist** compn.

using polymer with 1,2-diol structure)

IT 1886-74-4 55048-39-0 66003-78-9, Triphenylsulfonium

trifluoromethanesulfonate 157959-61-0, Bis(tert-butylphenyl)iodonium

trifluoromethanesulfonate 171292-12-9

RL: CAT (Catalyst use); USES (Uses)

(photoacid generator; patterning of neg.-working photoresist compn.

using polymer with 1,2-diol structure)

IT **265660-21-7P 265660-23-9P**RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(**patterning** of neg.-working **photoresist** compn.

using polymer with 1,2-diol structure)

RN 265660-21-7 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or

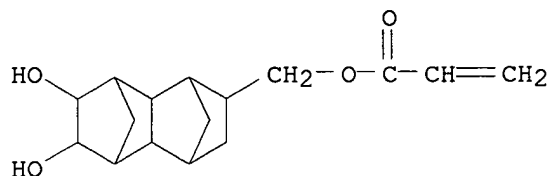
7)-[(1-oxo-2-propenyl)oxy]-, polymer with (decahydro-6,7-dihydroxy-1,4:5,8-

dimethanonaphthalen-2-yl)methyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 247262-09-5

CMF C16 H22 O4

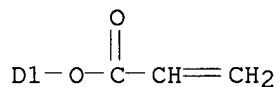
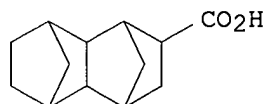


CM 2

CRN 195398-52-8

CMF C16 H20 O4

CCI IDS



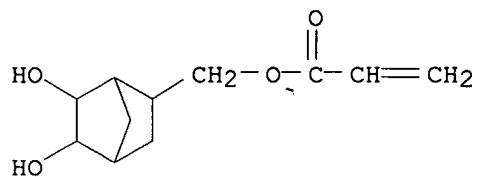
RN 265660-23-9 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(1-oxo-2-propenyl)oxy]-, polymer with (5,6-dihydroxybicyclo[2.2.1]hept-2-yl)methyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

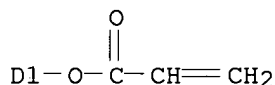
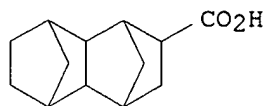
CRN 265660-22-8

CMF C11 H16 O4



CM 2

CRN 195398-52-8  
CMF C16 H20 O4  
CCI IDS



L44 ANSWER 27 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
AN 1999:572116 HCAPLUS  
DN 131:221221  
TI Resist composition with good etching resistance and pattern formation using it  
IN Sumino, Motoshige; Katsuyama, Akiko  
PA Wako Pure Chemical Industries, Ltd., Japan; Matsushita Electric Industrial Co., Ltd.  
SO Jpn. Kokai Tokkyo Koho, 22 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
IC ICM G03F007-039  
ICS H01L021-027; C08F020-16; C08F032-00  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
Section cross-reference(s): 38, 76  
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 11242337	A2	19990907	JP 1998-346601	19981119
PRAI JP 1997-335051		19971119		

AB The compn. contains (A) a polymer having a structural unit X(ZOCOR) [X = (un)substituted polycyclic hydrocarbon; Z = spacer or bond; R = (un)substituted alkyl or alkenyl having 1 or 2 protected OH group(s)], (B) a photosensitive compd. generating an acid by exposure, and (C) a solvent. Patterns are formed by applying the compn. on a substrate, heating, exposing with .ltoreq.220-nm light using a mask, optionally heating, and developing. The compn. is useful for manuf. of semiconductor devices. The compn. shows high transmittance for far UV light, good etching resistance, and high resolu. and sensitivity.

ST photoresist norbornene polymer etching resistance patterning; far UV resist norbornene polymer; semiconductor manuf photoresist norbornene polymer

IT Photoresists  
(far-UV; photoresist contg. norbornene polymer with good etching resistance for pattern formation)

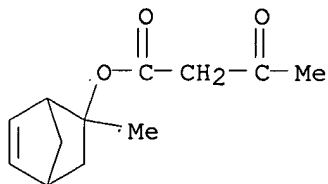
IT Semiconductor device fabrication  
(photoresist contg. norbornene polymer with good etching resistance for pattern formation)

- IT 66003-78-9, Triphenylsulfonium trifluoromethanesulfonate  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (acid generators; photoresist contg. norbornene polymer with good etching resistance for pattern formation)
- IT 71159-55-2P 242460-76-0P 242460-77-1P 242460-78-2P 242460-79-3P  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (photoresist contg. norbornene polymer with good etching resistance for pattern formation)
- IT 242460-80-6P 242460-81-7P 242460-82-8P 242460-83-9P  
**242460-85-1P**  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (photoresist contg. norbornene polymer with good etching resistance for pattern formation)
- IT 95-12-5, 5-Norbornene-2-methanol 115-84-4, 2-Butyl-2-ethyl-1,3-propanediol 122-51-0, Ethyl orthoformate 126-30-7 149-73-5, Methyl orthoformate 674-82-8, Diketene  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (photoresist contg. norbornene polymer with good etching resistance for pattern formation)
- IT 110-71-4, Ethylene glycol dimethyl ether  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (solvents; photoresist contg. norbornene polymer with good etching resistance for pattern formation)
- IT **242460-85-1P**  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (photoresist contg. norbornene polymer with good etching resistance for pattern formation)
- RN 242460-85-1 HCAPLUS
- CN 2-Butenoic acid, 3-methoxy-, 2-methylbicyclo[2.2.1]hept-5-en-2-yl ester, polymer with 2-methylbicyclo[2.2.1]hept-5-en-2-yl 3-oxobutanoate (9CI)  
 (CA INDEX NAME)

CM 1

CRN 242460-84-0

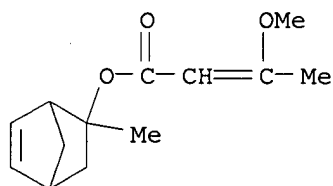
CMF C12 H16 O3



CM 2

CRN 242460-76-0

CMF C13 H18 O3



L44 ANSWER 28 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1999:412778 HCAPLUS

DN 131:108931

TI Acrylic polymer negative photoresists, formation of patterns using negative photoresists, and manufacture of semiconductor devices

IN Maeda, Katsumi; Iwasa, Shigeyuki; Nakano, Kaichiro; Hasegawa, Etsuo

PA NEC Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G03F007-038

ICS C08F220-18; C08G059-32; C08G059-40; H01L021-027

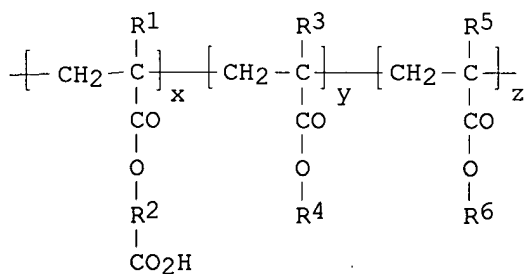
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 38, 76

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11174677	A2	19990702	JP 1997-343262	19971212
	JP 3033549	B2	20000417		
	US 6106998	A	20000822	US 1998-94021	19980609
PRAI	JP 1997-162716	A	19970619		
	JP 1997-343262	A	19971212		

GI



I

AB The resist comprises (a) an acrylic polymer of wt. av. mol. wt. 1000-500,000 having repeating unit I (R1, R3, R5 = H, Me; R2 = C7-18 bridged cyclic hydrocarbon moiety; R4 = epoxy-contg. hydrocarbon; R6 = H, C1-12 hydrocarbon; x + y + z = 1; 0 < x < 1; 0 ≤ y < 1; 0 ≤ z < 1), (b) a polyhydric alc., (c) a photoacid generator, and optionally (d) a polyfunctional epoxy compd. The resist contains d when y = 0 in I. The above resist is applied on a substrate, treated by light irradiation, baked,

and developed to form patterns. Manuf. of semiconductor devices utilizing the above pattern forming process is also claimed. The resist is capable of forming fine pattern, have high transparency, and have resistance to dry etching.

ST acrylic polymer neg photoresist pattern formation; semiconductor device fabrication photoresist pattern formation; polycyclic hydrocarbon acrylate polymer neg photoresist

IT Negative photoresists

Semiconductor device fabrication

(acrylic polymer neg. photoresists for formation of patterns in manuf. of semiconductor devices)

IT Epoxy resins, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(acrylic; acrylic polymer neg. photoresists for formation of patterns in manuf. of semiconductor devices)

IT 25086-25-3, EHPE 3150

RL: MOA (Modifier or additive use); USES (Uses)

(acrylic polymer neg. photoresists for formation of patterns in manuf. of semiconductor devices)

IT 6143-29-9P

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(acrylic polymer neg. photoresists for formation of patterns in manuf. of semiconductor devices)

IT 211377-75-2P 211427-30-4P 220238-51-7P **220238-54-0P**

**220238-56-2P** 220238-61-9P **220238-66-4P** 220238-67-5P

220238-69-7P **220238-71-1P** 220238-73-3P **230648-08-5P**

**230648-09-6P 230648-10-9P**

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(acrylic polymer neg. **photoresists** for formation of **patterns** in manuf. of semiconductor devices)

IT 95-12-5, 2-Hydroxymethyl-5-norbornene 826-62-0

RL: RCT (Reactant); RACT (Reactant or reagent)

(acrylic polymer neg. photoresists for formation of patterns in manuf. of semiconductor devices)

IT 556-48-9, 1,4-Cyclohexanediol 26160-83-8, Tricyclodecanedimethanol

RL: TEM (Technical or engineered material use); USES (Uses)

(acrylic polymer neg. photoresists for formation of patterns in manuf. of semiconductor devices)

IT **220238-54-0P 220238-56-2P 220238-66-4P**

**220238-71-1P 230648-08-5P 230648-09-6P**

**230648-10-9P**

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(acrylic polymer neg. **photoresists** for formation of **patterns** in manuf. of semiconductor devices)

RN 220238-54-0 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with oxiranylmethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

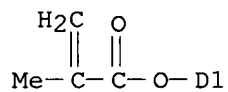
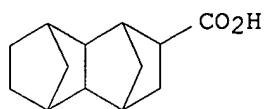
CM 1

CRN 195398-48-2

CMF C17 H22 O4

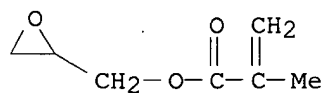
CCI IDS





CM 2

CRN 106-91-2  
CMF C7 H10 O3

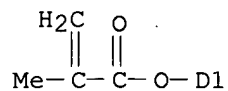
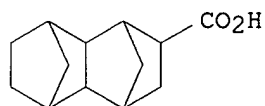


RN 220238-56-2 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with 7-oxabicyclo[4.1.0]hept-3-ylmethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

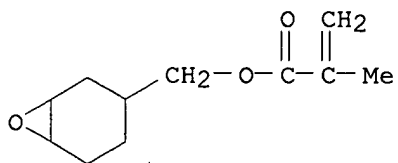
CM 1

CRN 195398-48-2  
CMF C17 H22 O4  
CCI IDS



CM 2

CRN 82428-30-6  
CMF C11 H16 O3



RN 220238-66-4 HCAPLUS

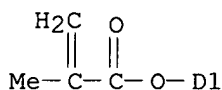
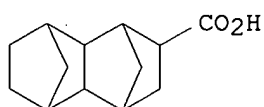
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with decahydro-2,7:3,6-dimethanonaphth[2,3-b]oxiren-4-yl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 195398-48-2

CMF C17 H22 O4

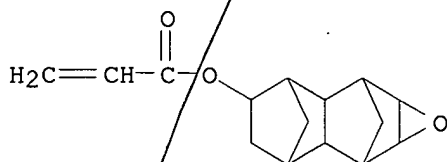
CCI IDS



CM 2

CRN 1147-02-0

CMF C15 H18 O3



RN 220238-71-1 HCAPLUS

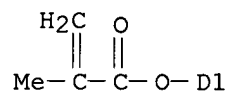
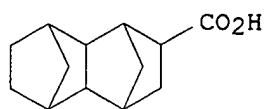
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with 5(or 6)-oxiranylbicyclo[2.2.1]hept-2-yl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 195398-48-2

CMF C17 H22 O4

CCI IDS

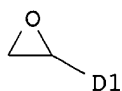
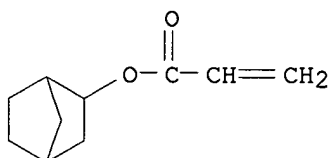


CM 2

CRN 25429-82-7

CMF C12 H16 O3

CCI IDS



RN 230648-08-5 HCAPLUS

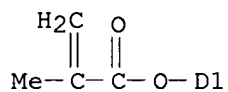
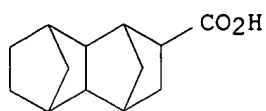
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with 3-oxatricyclo[3.2.1.0<sup>2,4</sup>]oct-6-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 195398-48-2

CMF C17 H22 O4

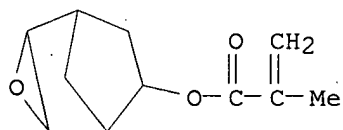
CCI IDS



CM 2

CRN 86311-28-6

CMF C11 H14 O3



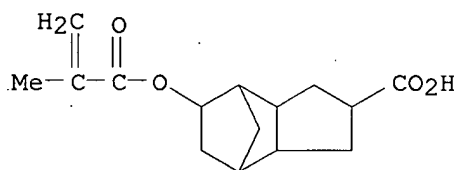
RN 230648-09-6 HCAPLUS

CN 4,7-Methano-1H-indene-2-carboxylic acid, octahydro-5-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with octahydro-2,5-methano-2H-indeno[1,2-b]oxiren-3(or 4)-yl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 217643-39-5

CMF C15 H20 O4

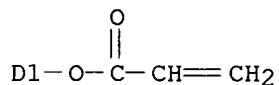
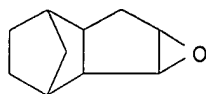


CM 2

CRN 138044-96-9

CMF C13 H16 O3

CCI IDS



RN 230648-10-9 HCAPLUS

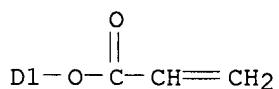
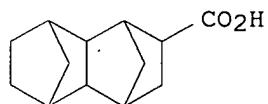
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(1-oxo-2-propenyl)oxy]-, polymer with 5(or 6)-oxiranylbicyclo[2.2.1]hept-2-yl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 195398-52-8

CMF C16 H20 O4

CCI IDS

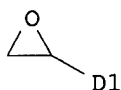
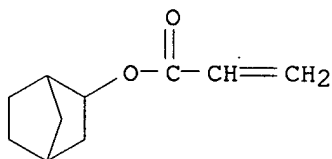


CM 2

CRN 25429-82-7

CMF C12 H16 O3

CCI IDS



L44 ANSWER 29 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1999:56804 HCAPLUS  
 DN 130:160672  
 TI Negative-working photoresist material and pattern formation using same  
 IN Maeda, Katsumi; Iwasa, Shigeyuki; Nakano, Kaichiro; Hasegawa, Etsuo  
 PA NEC Corp., Japan  
 SO Jpn. Kokai Tokkyo Koho, 13 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM G03F007-038  
 ICS G03F007-004; G03F007-033; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 38, 76

FAN.CNT 2

	PATENT-NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11015159	A2	19990122	JP 1997-162716	19970619
	JP 3022412	B2	20000321		
	US 6106998	A	20000822	US 1998-94021	19980609
PRAI	JP 1997-162716	A	19970619		
	JP 1997-343262	A	19971212		
AB	The title photoresist material contains a polymer with wt. av. mol. wt. 1000-500,000 having a formula $[CH_2CR_1(CO_2R_2CO_2H)]_x[CH_2CR_3(CO_2R_4)]_y[CH_2CR_5(CO_2R_6)]_z$ ( $R_1, R_3, R_5 = H$ or $Me$ ; $R_2 = C_7-18$ divalent hydrocarbon contg. bridge-contg. cyclic hydrocarbon; $R_4 =$ epoxy-contg. hydrocarbyl; $R_6 = H$ or $C_1-12$ hydrocarbyl; $x + y + z = 1$ , $0 < x < 1$ , $0 < y < 1$ , $0 \leq z < 1$ ) and a photoacid generator. The material may contain a polymer with wt. av. mol. wt. 1000-500,000 having a formula $[CH_2CR_1(CO_2R_2CO_2H)]_x[CH_2CR_5(CO_2R_6)]_z$ ( $R_1, R_2, R_5$ , and $R_6$ are same in the above; $x + z = 1$ , $0 < x \leq 1$ , $0 \leq z < 1$ ), a photoacid generator, and a polyfunctional epoxy compd. The material is coated on a substrate, patternwise exposed, baked, and developed to form a pattern. The material shows high sensitivity toward light of wavelength 180-220 nm, transparency, and etching resistance.				
ST	neg photoresist acrylic bridge cyclic polymer; epoxy photoresist photolithog semiconductor device fabrication				
IT	Polyisocyanurates Polyisocyanurates RL: TEM (Technical or engineered material use); USES (Uses) (epoxy; neg.-working photoresist material and pattern formation by photolithog.)				
IT	Negative photoresists Photolithography Semiconductor device fabrication (neg.-working photoresist material and pattern formation by photolithog.)				
IT	Epoxy resins, uses RL: TEM (Technical or engineered material use); USES (Uses) (neg.-working photoresist material and pattern formation by photolithog.)				
IT	Epoxy resins, uses Epoxy resins, uses RL: TEM (Technical or engineered material use); USES (Uses) (polyisocyanurate-; neg.-working photoresist material and pattern formation by photolithog.)				

IT 220238-51-7P **220238-54-0P 220238-56-2P**  
**220238-58-4P** 220238-61-9P **220238-63-1P**  
**220238-66-4P** 220238-67-5P 220238-69-7P **220238-71-1P**  
 220238-73-3P  
 RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
 (neg.-working **photoresist** material and **pattern** formation by photolithog.)

IT 2451-62-9 25086-25-3, EHPE 3150  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (neg.-working photoresist material and pattern formation by photolithog.)

IT 66003-78-9, Triphenylsulfonium triflate  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (photoacid generator; neg.-working photoresist material and pattern formation by photolithog.)

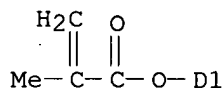
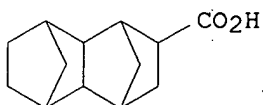
IT **220238-54-0P 220238-56-2P 220238-58-4P**  
**220238-63-1P 220238-66-4P 220238-71-1P**  
 RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
 (neg.-working **photoresist** material and **pattern** formation by photolithog.)

RN 220238-54-0 HCAPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with oxiranylmethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

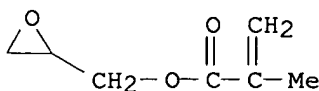
CM 1

CRN 195398-48-2  
 CMF C17 H22 O4  
 CCI IDS



CM 2

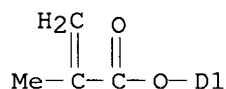
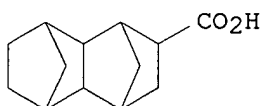
CRN 106-91-2  
 CMF C7 H10 O3



RN 220238-56-2 HCAPLUS  
 CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or  
 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with 7-oxabicyclo[4.1.0]hept-  
 3-ylmethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

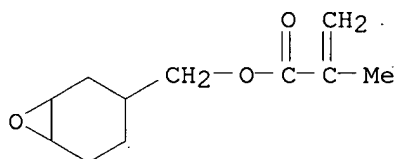
CM 1

CRN 195398-48-2  
 CMF C17 H22 O4  
 CCI IDS



CM 2

CRN 82428-30-6  
 CMF C11 H16 O3

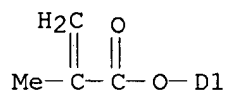
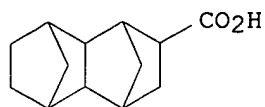


RN 220238-58-4 HCAPLUS  
 CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or  
 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with 3-  
 oxatricyclo[3.2.1.0<sup>2,4</sup>]oct-6-ylmethyl 2-methyl-2-propenoate (9CI) (CA  
 INDEX NAME)

CM 1

CRN 195398-48-2  
 CMF C17 H22 O4  
 CCI IDS

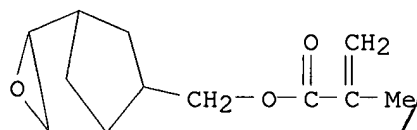




CM 2

CRN 85996-21-0

CMF C12 H16 O3



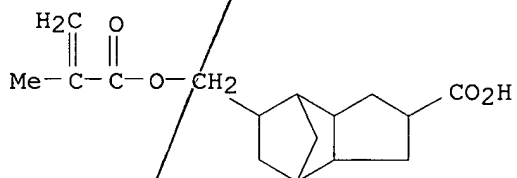
RN 220238-63-1 HCAPLUS

CN 4,7-Methano-1H-indene-2-carboxylic acid, octahydro-5-[[ (2-methyl-1-oxo-2-propenyl)oxy]methyl]-, polymer with octahydro-2,5-methano-2H-indeno[1,2-b]oxiren-3(or 4)-yl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 216308-49-5

CMF C16 H22 O4

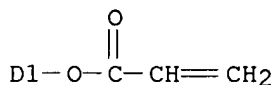
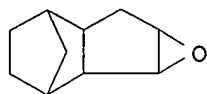


CM 2

CRN 138044-96-9

CMF C13 H16 O3

CCI IDS



RN 220238-66-4 HCAPLUS

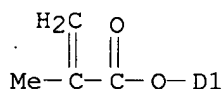
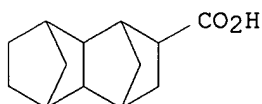
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with decahydro-2,7:3,6-dimethanonaphth[2,3-b]oxiren-4-yl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 195398-48-2

CMF C17 H22 O4

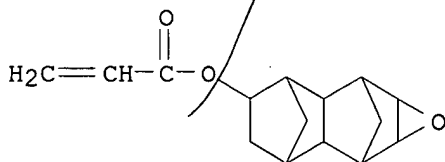
CCI IDS



CM 2

CRN 1147-02-0

CMF C15 H18 O3



RN 220238-71-1 HCAPLUS

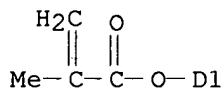
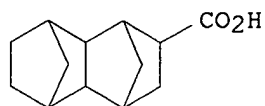
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with 5(or 6)-oxiranylbicyclo[2.2.1]hept-2-yl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 195398-48-2

CMF C17 H22 O4

CCI IDS

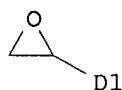
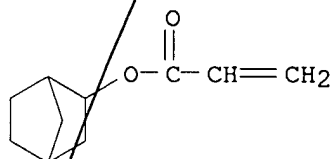


CM 2

CRN 25429-82-7

CMF C12 H16 O3

CCI IDS



L44 ANSWER 30 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1998:782011 HCAPLUS

DN 130:73861

TI Photoresist composition and resist pattern formation using same

IN Nozaki, Koji; Yano, Akira

PA Fujitsu Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G03F007-039

ICS C08L101-06; C09D005-00; C09D201-06; H01L021-027

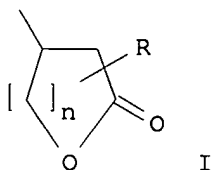
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

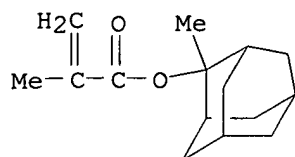
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10319595	A2	19981204	JP 1997-130131	19970520

PRAI JP 1997-130131  
GI

19970520



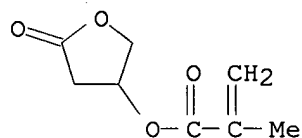
- AB The resist compn. contains a basic aq. soln.-insol. polymer which has protective group-contg. carboxyl group in the side chain of the monomer unit and becomes sol. in basic aq. solns. when the protective group releases from the side chain and optionally a photoacid-generating agent, and the protective group has the general formula I (R = H or monovalent hydrocarbon group; n = 1-4; R links to the positions except the third position at which the ester bond is formed). The resist is coated on a substrate to be processed, selectively exposed to light that can induce the decompn. of the photoacid-generating agent, and developed with an basic aq. soln. to form a pattern. The compn. provides high resoln. pos. patterns by using KrF and ArF excimer lasers.
- ST pos photoresist protected carboxyl acrylic polymer; butyrolactone methacrylate copolymer pos photoresist; adamantyl methacrylate copolymer pos photoresist
- IT Positive photoresists  
(pattern formation using photoresist compn. contg. polymer having protective group-contg. carboxyl group)
- IT 66003-76-7, Diphenyliodonium trifluoromethanesulfonate 66003-78-9, Triphenylsulfonium trifluoromethanesulfonate  
RL: TEM (Technical or engineered material use); USES (Uses)  
(acid generator; pattern formation using photoresist compn. contg. polymer having protective group-contg. carboxyl group)
- IT **195000-69-2P**, .gamma.-Butyrolacton-3-yl methacrylate-2-methyl-2-adamantyl methacrylate copolymer **218151-81-6P**, .gamma.-Butyrolacton-3-yl methacrylate-norbornyl methacrylate copolymer  
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(pattern formation using photoresist compn. contg. polymer having protective group-contg. carboxyl group)
- IT **195000-69-2P**, .gamma.-Butyrolacton-3-yl methacrylate-2-methyl-2-adamantyl methacrylate copolymer **218151-81-6P**, .gamma.-Butyrolacton-3-yl methacrylate-norbornyl methacrylate copolymer  
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(pattern formation using photoresist compn. contg. polymer having protective group-contg. carboxyl group)
- RN 195000-69-2 HCAPLUS
- CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl ester, polymer with tetrahydro-5-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)
- CM 1
- CRN 177080-67-0
- CMF C15 H22 O2



CM 2

CRN 130224-95-2

CMF C8 H10 O4



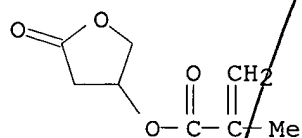
RN 218151-81-6 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, bicyclo[2.2.1]heptyl ester, polymer with tetrahydro-5-oxo-3-furanyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 130224-95-2

CMF C8 H10 O4

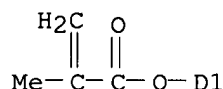


CM 2

CRN 111965-24-3

CMF C11 H16 O2

CCI IDS



L44 ANSWER 31 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1998:747537 HCAPLUS  
 DN 130:73843  
 TI Photosensitive resin composition and patterning using the same  
 IN Nakano, Kaichiro; Maeda, Katsumi; Iwasa, Shigeyuki; Haségawa, Etsuo  
 PA NEC Corp., Japan  
 SO Jpn. Kokai Tokkyo Koho, 27 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM G03F007-039  
 ICS G03F007-039; C08F220-18; C08F220-28; C08K005-00; C08L033-06;  
 C08L033-14; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 76

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10307400	A2	19981117	JP 1998-38207	19980220
	JP 2973998	B2	19991108		
	US 6287746	B1	20010911	US 1998-36219	19980306
	US 6030747	A	20000229	US 1998-124673	19980729
PRAI	JP 1997-52678	A	19970307		
	JP 1998-38207	A	19980220		
	US 1998-36219	A2	19980306		
AB	The photosensitive resin compn. comprises a photoacid and a polymer obtained by polyimg. precursors which include a vinyl monomer represented by $\text{H}_2\text{C}=\text{CR}_1\text{C}(\text{:O})(\text{CH}_2)_m\text{R}_2(\text{CH}_2)_n\text{OR}_3$ ( $\text{R}_1 = \text{H}, \text{Me}$ ; $\text{R}_2 = \text{C}_7\text{-22}$ bridged hydrocarbon; $m, n = 0, 1$ ; and $\text{R}_3 = \text{Me}, \text{acetyl}$ ). The patterning method using an ArF excimer laser and an aq. alk. developer was also claimed. The photosensitive resin compn. is particularly suited for a photolithog. process used in manufg. semiconductor devices, and exhibited high optical transparency to UV light with the wavelength of .ltoreq.248 nm.				
ST	photosensitive resin compn resist patterning; semiconductor device photolithog resist patterning				
IT	Photolithography UV laser radiation (patterning of resist film contg. vinyl copolymer)				
IT	Resists (vinyl copolymer contained in photosensitive resin compn.)				
IT	814-68-6, Acryloyl chloride 920-46-7, Methacryloyl chloride 6143-29-9 28132-01-6 41596-02-5 46004-74-4 129316-49-0, Bicyclo[2.2.1]hept-2-ene-2,3-diol 154970-45-3 195057-79-5, 8-tert-Butoxycarbonyltetracyclo[4.4.0.12,5.17,10]-3-dodecene				

RL: RCT (Reactant); RACT (Reactant or reagent)  
(photoresist compn.)

IT 52492-68-9P 103206-16-2P 173161-68-7P 173161-69-8P 188136-21-2P  
195398-48-2P 195398-50-6P 195398-52-8P 195891-99-7P 216393-32-7P  
216393-33-8P 216445-93-1P 216446-30-9P 217643-24-8P 217643-26-0P  
217643-27-1P 217643-28-2P 217643-29-3P 217643-30-6P 217643-31-7P  
217643-33-9P 217643-34-0P 217643-36-2P 217643-37-3P 217643-39-5P  
217643-40-8P 217643-41-9P 217643-42-0P 217643-44-2P 217643-45-3P  
217643-46-4P 217652-49-8P 217652-52-3P 217652-55-6P 217652-61-4P  
217652-64-7P 217652-66-9P 217652-68-1P 217652-72-7P 217652-84-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)

(photoresist compn.)

IT 217652-31-8P

RL: SPN (Synthetic preparation); TEM (Technical or engineered material  
use); PREP (Preparation); USES (Uses)

(photoresist compn.)

IT 217643-47-5P **217643-48-6P** 217643-50-0P 217652-85-2P  
217654-91-6P 217654-93-8P 217654-95-0P **217654-96-1P**  
**217654-97-2P** 217654-98-3P 217654-99-4P

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered  
material use); **PREP (Preparation)**; USES (Uses)

(**photoresist compn. and patterning** thereof)

IT 217643-43-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)

(sto photoresist compn.)

IT **217643-48-6P 217654-96-1P 217654-97-2P**

RL: **SPN (Synthetic preparation)**; TEM (Technical or engineered  
material use); **PREP (Preparation)**; USES (Uses)

(**photoresist compn. and patterning** thereof)

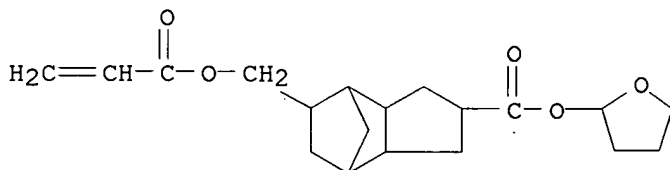
RN 217643-48-6 HCAPLUS

CN 4,7-Methano-1H-indene-2-carboxylic acid, octahydro-5-[[[(1-oxo-2-  
propenyl)oxy]methyl]-, tetrahydro-2-furanyl ester, polymer with  
octahydro-2-hydroxy-4,7-methano-1H-inden-5-yl 2-methyl-2-propenoate (9CI)  
(CA INDEX NAME)

CM 1

CRN 217643-43-1

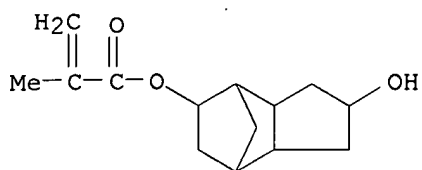
CMF C19 H26 O5



CM 2

CRN 217643-24-8

CMF C14 H20 O3



RN 217654-96-1 HCAPLUS

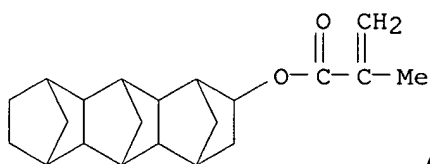
CN 1,4:5,8:9,10-Trimethanoanthracene-2-carboxylic acid, tetradecahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, 1-ethoxyethyl ester, polymer with 6(or 7)-(acetyloxy)tetradecahydro-1,4:5,8:9,10-trimethanoanthracen-2-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 217652-68-1

CMF C23 H30 O4

CCI IDS



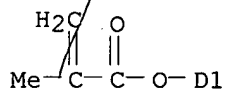
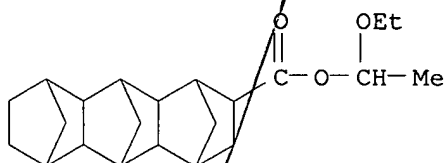
D1-O-Ac

CM 2

CRN 216445-93-1

CMF C26 H36 O5

CCI IDS



RN 217654-97-2 HCAPLUS

CN 1,4:5,12:6,11:7,10-Tetramethanonaphthacene-2-carboxylic acid, octadecahydro-8(or 9)-[(2-methyl-1-oxo-2-propenyl)oxy]-, 1-butoxyethyl



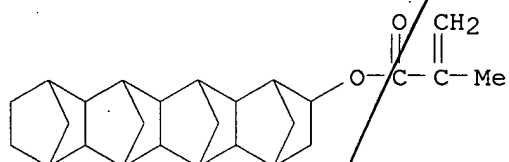
ester, polymer with 8(or 9)-(acetyloxy)octadecahydro-1,4:5,12:6,11:7,10-tetramethanonaphthacen-2-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 217652-72-7

CMF C28 H36 O4

CCI IDS



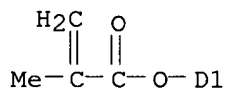
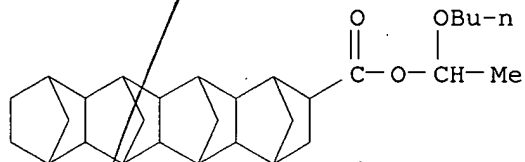
D1-O-Ac

CM 2

CRN 217652-61-4

CMF C33 H46 O5

CCI IDS

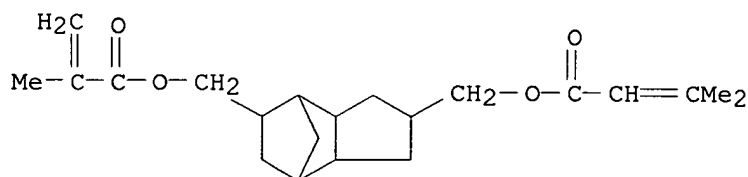


L44 ANSWER 32 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1998:721577 HCAPLUS  
 DN 129:349062  
 TI Resist composition and its use for forming patterns  
 IN Sumino, Motoshige; Fukasawa, Kazuhito; Matsuo, Takahiro  
 PA Wako Pure Chemical Industries, Ltd, Japan; Matsushita Electric Industrial Co., Ltd.  
 SO Eur. Pat. Appl., 32 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM G03F007-039

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

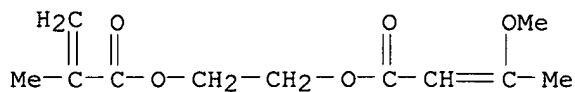
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 875789	A1	19981104	EP 1998-303331	19980429
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 11015164	A2	19990122	JP 1998-136123	19980430
PRAI	JP 1997-126402		19970430		
AB	A resist compn. comprising (a) a polymer having repeating units of the formula $-\text{C}(\text{R1})(\text{R2})\text{C}(\text{R3})\text{ZOCOR4}-$ (R1-3 = hydrogen, alkyl, cyano, alkyloxy, carbonyl, or carbamoyl; Z = a spacer or a direct link and R = hydroxyalkyl having protected terminal hydroxy), (b) a photoacid generator, and (c) a solvent is effective for forming patterns using an ArF excimer laser.				
ST	argon fluoride laser photoresist vinyl polymer				
IT	66003-78-9, Triphenylsulfonium trifluoromethanesulfonate				
	RL: TEM (Technical or engineered material use); USES (Uses) (photoresists effective for forming patterns using argon fluoride excimer lasers contg. vinyl resins and)				
IT	128692-52-4P	215051-44-8P	215051-47-1P	215051-54-0P	215382-86-8P
	RL: RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses) (prepn. and reaction in prep. resins for photoresists)				
IT	215051-56-2P	215382-88-0P	215382-90-4P		
	RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (prepn. and use in photoresists effective for forming patterns using argon fluoride excimer lasers)				
RE.CNT	1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD				
RE					
(1)	Ciba-Geigy Ag; EP 0347381 A 1989 HCAPLUS				
IT	215382-88-0P 215382-90-4P				
	RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (prepn. and use in photoresists effective for forming patterns using argon fluoride excimer lasers)				
RN	215382-88-0 HCAPLUS				
CN	2-Butenoic acid, 3-methoxy-, 2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl ester, polymer with [octahydro-5-[[[(2-methyl-1-oxo-2-propenyl)oxy]methyl]-4,7-methano-1H-inden-2-yl]methyl 3-methyl-2-butenate (9CI) (CA INDEX NAME)				
CM	1				
CRN	215382-86-8				
CMF	C21 H30 O4				



CM 2

CRN 215051-44-8

CMF C11 H16 O5



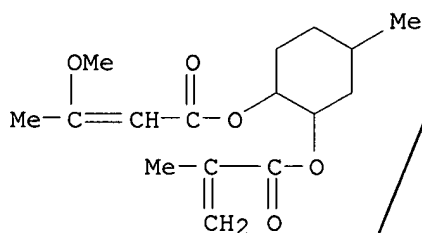
RN 215382-90-4 HCAPLUS

CN 2-Butenoic acid, 3-methoxy-, 4-methyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]cyclohexyl ester, polymer with 1-methyl-1-[4-methyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]cyclohexyl]ethyl 3-oxobutanoate (9CI) (CA INDEX NAME)

CM 1

CRN 215382-89-1

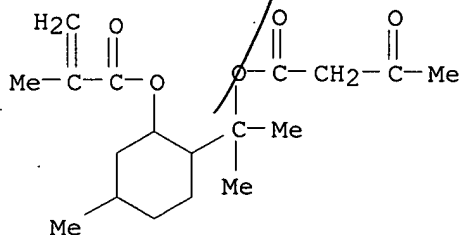
CMF C16 H24 O5



CM 2

CRN 215051-54-0

CMF C18 H28 O5



L44 ANSWER 33 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1998:693465 HCAPLUS

DN 130:31170

TI (Meth)acrylate ester, its polymer, chemically amplified photoresist composition containing it, and its patterning

IN Maeda, Katsumi; Iwasa, Shigeyuki; Nakano, Kaichiro; Hasegawa, Etsuo  
 PA NEC Corp., Japan  
 SO Jpn. Kokai Tokkyo Koho, 12 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM C08F020-12  
 ICS C07C069-54; C07C069-757; G03F007-033  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10287712	A2	19981027	JP 1997-99064	19970416
	JP 2943759	B2	19990830		
	US 6248499	B1	20010619	US 1998-58349	19980410
	US 2001031429	A1	20011018	US 2001-811398	20010320
	US 6391529	B2	20020521		
	US 2002111509	A1	20020815	US 2001-811399	20010320
	US 6559337	B2	20030506		
PRAI	JP 1997-99064	A	19970416		
	US 1998-58349	A3	19980410		

OS MARPAT 130:31170

AB The (meth)acrylate ester comprises  $\text{CH}_2:\text{CR}_1\text{CO}_2\text{R}_2\text{CO}_2\text{R}_3$  (I;  $\text{R}_1 = \text{H, Me}$ ;  $\text{R}_2 = \text{C}_{17-23}$  divalent hydrocarbon having bridged cyclic hydrocarbon group;  $\text{R}_3 = \text{acid-decomposable group, H}$ ). The polymer with wt.-av. mol. wt. 1000-500,000, preferably shown as  $(\text{CH}_2:\text{CR}_4\text{CO}_2\text{R}_5\text{CO}_2\text{H})_x(\text{CH}_2:\text{CR}_6\text{CO}_2\text{R}_7\text{CO}_2\text{R}_8)_y(\text{CH}_2:\text{CR}_9\text{CO}_2\text{R}_{10})_z$  ( $\text{R}_4, \text{R}_6, \text{R}_9 = \text{H, Me}$ ;  $\text{R}_5, \text{R}_7 = \text{C}_{17-23}$  divalent hydrocarbon having bridged cyclic hydrocarbon group;  $\text{R}_8 = \text{acid-decomposable group}$ ;  $\text{R}_{10} = \text{C}_{1-12}$  hydrocarbyl;  $x + y + z = 1$ ;  $x, y = 0-1$ ;  $z = 0-0.9$ ), is obtained by polymn. of I and other copolymerizable compds. The photoresist compn. contains 70-99.9 wt.% of the above polymer and 0.2-30 wt.% photoacid generator. The patterning involves the following steps: (1) application of the above compn. on a substrate, (2) exposure with 180-220-nm light, (3) baking, and (4) development. The resist compn. shows high transparency to  $\text{ltoreq.}220\text{-nm}$  light and gives resist patterns with good adhesion to substrates and good etching resistance to be useful for fine patterning in manuf. of semiconductor devices.

ST methacrylate bridged cyclic group photoresist patterning; chem amplified resist acrylate polymer patterning; semiconductor device fine patterning methacrylate resist

IT Photoresists

(patterning method using chem. amplified photoresist compn. contg. (meth)acrylate ester-based polymer having bridged cyclic group)

IT Monomers

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(patterning method using chem. amplified photoresist compn. contg. (meth)acrylate ester-based polymer having bridged cyclic group)

IT 216445-85-1P 216445-88-4P 216445-91-9P 216445-94-2P 216445-97-5P  
 216446-00-3P

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(monomer; patterning method using chem. amplified photoresist compn. contg. (meth)acrylate ester-based polymer having bridged cyclic group)

IT 920-46-7P, Methacryloyl chloride 52492-68-9P 216393-32-7P  
 216393-34-9P 216446-03-6P 216446-30-9P

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation);  
RACT (Reactant or reagent)

(patterning method using chem. amplified photoresist compn. contg.  
(meth)acrylate ester-based polymer having bridged cyclic group)

IT **216447-45-9P 216447-46-0P 216447-47-1P**  
**216447-48-2P 216447-50-6P 216447-53-9P**  
216447-55-1P

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material  
use); **PREP (Preparation)**; USES (Uses)

(**patterning** method using chem. amplified **photoresist**  
compn. contg. (meth)acrylate ester-based polymer having bridged cyclic  
group)

IT 75-65-0, tert-Butyl alcohol, reactions 77-73-6 110-87-2,  
3,4-Dihydro-2H-pyran 407-25-0, Trifluoroacetyl anhydride 41596-02-5  
216393-35-0

RL: RCT (Reactant); RACT (Reactant or reagent)

(patterning method using chem. amplified photoresist compn. contg.  
(meth)acrylate ester-based polymer having bridged cyclic group)

IT 66003-78-9, Triphenylsulfonium triflate

RL: CAT (Catalyst use); USES (Uses)

(photoacid generator; patterning method using chem. amplified  
photoresist compn. contg. (meth)acrylate ester-based polymer having  
bridged cyclic group)

IT 814-68-6, Acryloyl chloride

RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES  
(Uses)

(photoacid generator; patterning method using chem. amplified  
photoresist compn. contg. (meth)acrylate ester-based polymer having  
bridged cyclic group)

IT **216447-45-9P 216447-47-1P 216447-48-2P**  
**216447-50-6P 216447-53-9P**

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material  
use); **PREP (Preparation)**; USES (Uses)

(**patterning** method using chem. amplified **photoresist**  
compn. contg. (meth)acrylate ester-based polymer having bridged cyclic  
group)

RN 216447-45-9 HCAPLUS

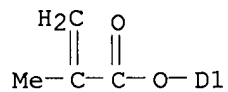
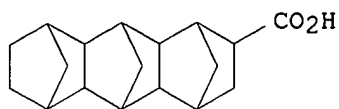
CN 1,4:5,8:9,10-Trimethanoanthracene-2-carboxylic acid, tetradecahydro-6(or  
7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with tetrahydro-2H-pyran-2-  
yl tetradecahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-1,4:5,8:9,10-  
trimethanoanthracene-2-carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 217652-84-1

CMF C22 H28 O4

CCI IDS

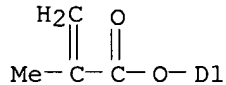
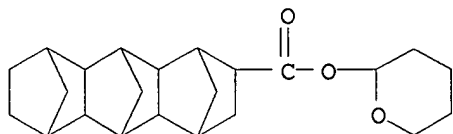


CM 2

CRN 216445-84-0

CMF C27 H36 O5

CCI IDS



RN 216447-47-1 HCAPLUS

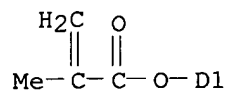
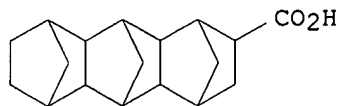
CN 1,4:5,8:9,10-Trimethanoanthracene-2-carboxylic acid, tetradecahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with tetrahydro-2H-pyran-2-yl tetradecahydro-6(or 7)-[(1-oxo-2-propenyl)oxy]-1,4:5,8:9,10-trimethanoanthracene-2-carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 217652-84-1

CMF C22 H28 O4

CCI IDS

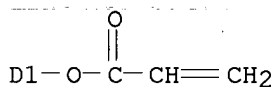
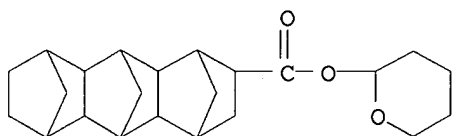


CM 2

CRN 216445-96-4

CMF C26 H34 O5

CCI IDS



RN 216447-48-2 HCAPLUS

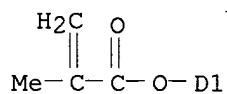
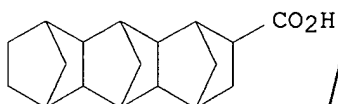
CN 1,4:5,8:9,10-Trimethanoanthracene-2-carboxylic acid, tetradecahydro-2-methyl-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, tetrahydro-2H-pyran-2-yl ester, polymer with tetradecahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-1,4:5,8:9,10-trimethanoanthracene-2-carboxylic acid (9CI)  
(CA INDEX NAME)

CM 1

CRN 217652-84-1

CMF C22 H28 O4

CCI IDS

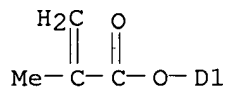
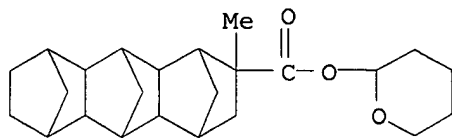


CM 2

CRN 216445-99-7

CMF C28 H38 O5

CCI IDS



RN 216447-50-6 HCAPLUS

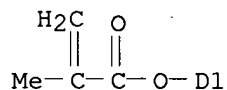
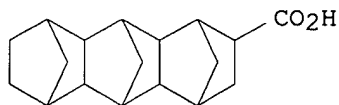
CN 1,4:5,8:9,10-Trimethanoanthracene-2-carboxylic acid, tetradecahydro-6(or 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-, polymer with 1-ethoxyethyl tetradecahydro-6(or 7)-[(1-oxo-2-propenyl)oxy]-1,4:5,8:9,10-trimethanoanthracene-2-carboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 217652-84-1

CMF C22 H28 O4

CCI IDS



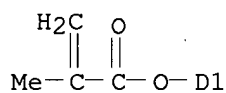
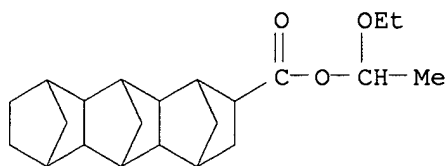
CM 2

CRN 216445-93-1

CMF C26 H36 O5

CCI IDS





RN 216447-53-9 HCAPLUS

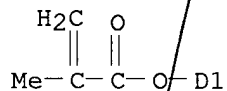
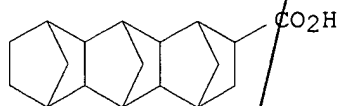
CN 1,4:5,12:6,11:7,10-Tetramethanonaphthacene-2-carboxylic acid,  
 octadecahydro-2-methyl-8(or 9)-[(2-methyl-1-oxo-2-propenyl)oxy]-,  
 tetrahydro-2H-pyran-2-yl ester, polymer with tetradecahydro-6(or  
 7)-[(2-methyl-1-oxo-2-propenyl)oxy]-1,4:5,8:9,10-trimethanoanthracene-2-  
 carboxylic acid (9CI) (CA INDEX NAME)

CM 1

CRN 217652-84-1

CMF C22 H28 O4

CCI IDS

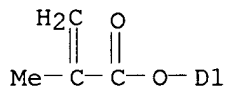
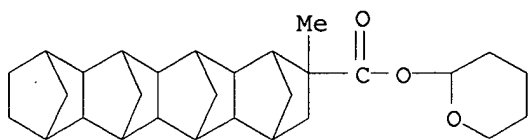


CM 2

CRN 216447-52-8

CMF C33 H44 O5

CCI IDS



L44 ANSWER 34 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1998:466481 HCAPLUS

DN 129:115622

TI Bottom antireflective coating material composition and method of forming resist pattern using same

IN Mizutani, Kazuyoshi; Momota, Makoto

PA Fuji Photo Film Co., Ltd., Japan

SO Eur. Pat. Appl., 52 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM G03F007-09

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 851300	A1	19980701	EP 1997-122819	19971223
	EP 851300	B1	20011024		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 10186671	A2	19980714	JP 1996-343738	19961224
	JP 10239837	A2	19980911	JP 1997-46001	19970228
	US 6165684	A	20001226	US 1997-997393	19971223
PRAI	JP 1996-343738	A	19961224		
	JP 1997-46001	A	19970228		
AB	A compn. for a bottom antireflective coating material and a method for forming a resist pattern using the compn., which is high in the dry etching rate, high in the resoln., excellent in the resist film thickness dependency and high in the effect of preventing reflective light against exposure light and provides no intermixing with the photoresist layer, are disclosed, wherein the compn. for a bottom antireflective coating material comprises a naphthalene group-contg. polymer having a specific structure.				
ST	photoresist bottom antireflective coating naphthalene polymer				
IT	Photoresists				
	(bottom antireflective coating compns. contg. naphthalene group-contg. polymers for)				
IT	125404-00-4P 209848-36-2P				
	RL: RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)				
	(prepn. and reaction in prepn. of naphthalene group-contg. polymers for prep. bottom antireflective coatings for photoresist patterns)				

IT 209848-19-1P 209848-21-5P 209848-23-7P  
 209848-24-8P 209848-26-0P 209848-27-1P 209848-28-2P  
 209848-30-6P 209848-32-8P 209848-34-0P 209848-35-1P  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (prepn. and use in coating compns. for prepg. bottom antireflective coatings for photoresist patterns)

IT 80-62-6 93-09-4, 2-Naphthoic acid 106-91-2 107-13-1,  
 2-Propenenitrile, reactions 110-63-4, 1,4-Butanediol, reactions  
 121-44-8, reactions 580-13-2, 2-Bromonaphthalene 586-78-7,  
 1-Bromo-4-nitrobenzene 605-02-7, 1-Phenylnaphthalene 716-39-2,  
 2,3-Naphthalenedicarboxylic anhydride 818-61-1 822-06-0 868-77-9  
 920-46-7, Methacryloyl chloride 923-26-2, 2-Hydroxypropyl methacrylate  
 924-42-5, N-Methylolacrylamide 2508-29-4, 5-Aminopentanol 2767-70-6,  
 (4-Nitrobenzyl)triphenylphosphonium bromide 3453-33-6,  
 6-Methoxy-2-naphthaldehyde 13728-34-2, Dimethyl 2,3-naphthalenedicarboxylate 39465-46-8, Diethylene glycol acrylate 209848-37-3  
 RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)  
 (reaction in prepn. of naphthalene group-contg. polymers for prepg. bottom antireflective coatings for photoresist patterns)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Flame, T; WO 9707145 A HCAPLUS
- (2) Ibm Corporation; EP 0583205 A HCAPLUS
- (3) Ibm Corporation; EP 0698823 A HCAPLUS
- (4) Japan Synthetic Rubber Co Ltd; US 5525457 A HCAPLUS
- (5) Tom, L; PROCEEDINGS SPIE 1994, V2195, P225

IT 209848-19-1P 209848-21-5P 209848-24-8P  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (prepn. and use in coating compns. for prepg. bottom antireflective coatings for photoresist patterns)

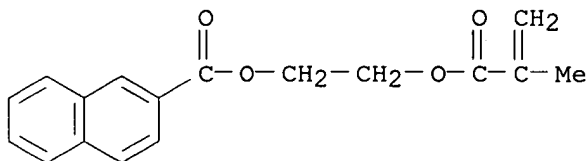
RN 209848-19-1 HCAPLUS

CN 2-Naphthalenecarboxylic acid, 2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl ester, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 209848-18-0

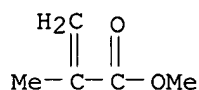
CMF C17 H16 O4



CM 2

CRN 80-62-6

CMF C5 H8 O2



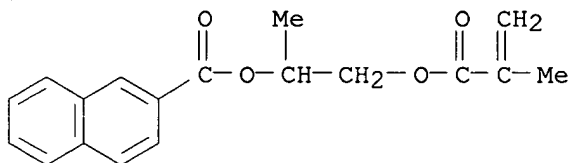
RN 209848-21-5 HCAPLUS

CN 2-Naphthalenecarboxylic acid, 1-methyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl ester, polymer with 2-hydroxypropyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 209848-20-4

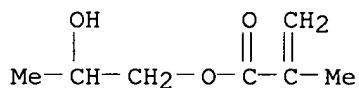
CMF C18 H18 O4



CM 2

CRN 923-26-2

CMF C7 H12 O3



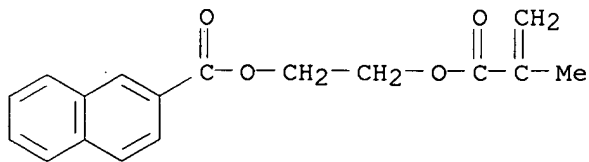
RN 209848-24-8 HCAPLUS

CN 2-Naphthalenecarboxylic acid, 2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl ester, polymer with 2-(2-hydroxyethoxy)ethyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

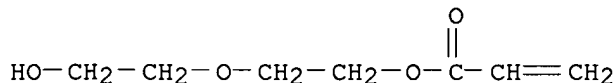
CRN 209848-18-0

CMF C17 H16 O4



CM 2

CRN 13533-05-6  
CMF C7 H12 O4



L44 ANSWER 35 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1998:59401 HCAPLUS

DN 128:129242

TI Water-soluble polymers for antireflective films and resist pattern formation therewith

IN Urano, FumiYoshi; Ono, Keiji; Mori, Yasuyoshi

PA Wako Pure Chemical Industries, Ltd., Japan

SO Jpn. Kokai Tokyo Koho, 16 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08F220-04

ICS C08F220-64; G03F007-004; H01L021-027

CC 42-7 (Coatings, Inks, and Related Products)

Section cross-reference(s): 74

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10017623	A2	19980120	JP 1996-195409	19960705
PRAI	JP 1996-195409		19960705		

AB The polymers represented by  $[\text{CH}_2\text{C}(\text{OH})\text{CO}_2\text{H}]_k[\text{CH}_2\text{C}(\text{CO}_2\text{H})\text{CH}_2\text{O}(\text{CHR})_n\text{R}_1]_j[\text{CH}_2\text{C}(\text{CO}_2\text{H})\text{R}_2]_m$  [R1, R = H, F, alkyl, fluoroalkyl; .gtoreq.1 R1 and R = fluoroalkyl; n = 1-3; R2 = H, alkyl, fluoroalkyl, hydroxyalkyl; k, j = natural no.; m .gtoreq. 0; j/(k + j + m) = 0.05-0.7; m/(k + j + m) = 0-0.7] are manufd. The pattern formation process comprises (1) coating substrates with resist materials and heating, (2) coating the resulting resist surface with antireflective materials contg. the polymers [j/(k + j + m) 0.1-0.5; m/(k + j + m) = 0-0.5], (3) irradiating radiation on the surface through a mask and if necessary heating, and (4) developing. Thus, polymg. 8.2 g Me .alpha.-acetyloxyacrylate (I) and 2.0 g Et .alpha.-2,2,2-trifluoroethyloxymethylacrylate (II) in PhMe in the presence of a catalyst and hydrolyzing the resulting polymer (I/II 85/15) gave a product (III). Multireflection in a resist film was suppressed by the use of an antireflective film contg. III.

ST fluoro hydroxyacrylic polymer antireflective coating; photoresist pattern formation antireflective coating

IT Antireflective films

Photoresists

(water-sol. acrylic polymers for antireflective coating in photoresist pattern formation)

IT 123589-22-0, p-tert-Butoxystyrene-p-hydroxystyrene copolymer  
138529-81-4, Biscyclohexylsulfonyldiazomethane 138529-84-7,  
Bis(1,1-dimethylethylsulfonyl)diazomethane 158593-28-3,  
p-1-Ethoxyethoxystyrene-p-hydroxystyrene copolymer

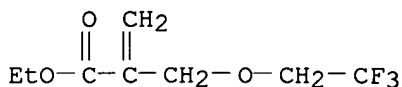
RL: TEM (Technical or engineered material use); USES (Uses)

(photoresists contg.; water-sol. acrylic polymers for antireflective coating in photoresist pattern formation)

- IT 10029-04-6P, Ethyl .alpha.-(hydroxymethyl)acrylate  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and chlorination of)
- IT 17435-77-7P, Ethyl .alpha.-(chloromethyl)acrylate  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and fluorination of)
- IT 686-46-4P, Methyl .alpha.-acetyloxyacrylate 136893-10-2P, Ethyl .alpha.-(2,2,2-trifluoroethyloxymethyl)acrylate  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. of)
- IT 867-13-0, Triethyl phosphonoacetate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(prepn. of Et hydroxymethylacrylate from)
- IT 600-22-6, Methyl pyruvate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(prepn. of Me acetyloxyacrylate from)
- IT 202054-34-ODP, Ethyl .alpha.-(2,2,2-trifluoroethyloxymethyl)acrylate-methyl .alpha.-acetyloxyacrylate copolymer, hydrolyzed 202054-35-1DP, Ethyl .alpha.-(hydroxymethyl)acrylate-ethyl .alpha.-(2,2,2-trifluoroethyloxymethyl)acrylate-methyl .alpha.-acetyloxyacrylate copolymer, hydrolyzed 202054-36-2DP, Ethyl .alpha.-(2,2,2-trifluoroethyloxymethyl)acrylate-methyl .alpha.-acetyloxyacrylate-methyl methacrylate copolymer, hydrolyzed  
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(water-sol. acrylic polymers for antireflective coating in photoresist pattern formation)
- IT 202054-34-ODP, Ethyl .alpha.-(2,2,2-trifluoroethyloxymethyl)acrylate-methyl .alpha.-acetyloxyacrylate copolymer, hydrolyzed  
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(water-sol. acrylic polymers for antireflective coating in photoresist pattern formation)
- RN 202054-34-0 HCAPLUS
- CN 2-Propenoic acid, 2-(acetyloxy)-, methyl ester, polymer with ethyl 2-[(2,2,2-trifluoroethoxy)methyl]-2-propenoate (9CI) (CA INDEX NAME)

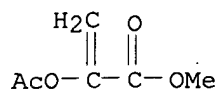
CM 1

CRN 136893-10-2  
CMF C8 H11 F3 O3



CM 2

CRN 686-46-4  
CMF C6 H8 O4



L44 ANSWER 36 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1998:47856 HCAPLUS

DN 128:174154

TI Resist patterning capable of dry development

IN Shita, Naomi; Gokochi, Toru; Asakawa, Koji; Nakase, Atsushi

PA Toshiba Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 26 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G03F007-36

ICS G03F007-038; G03F007-039; G03F007-38; H01L021-027

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10010752	A2	19980116	JP 1996-167810	19960627
PRAI	JP 1996-167810		19960627		

AB The title process comprises the steps of forming a resist film made of a photosensitive compn. contg. an aliph. compd. or a compd. having a terpenoid or alicyclic skeleton on a substrate, patternwise exposing the film, subjecting the exposed film to silylation, and dry-developing the treated film. This process useful in prodn. of high d. semiconductor devices is developable with O plasma and high resolu. patterns are obtained. Thus, a photosensitive compn. contg. menthyl acrylate-glycidyl methacrylate copolymer and Ph3S+.CF3SO3- was coated on a wafer, pre-baked, patternwise exposed using an ArF excimer laser, treated with hexamethyldisilazane vapor, and then subjected to O plasma etching to form a high resolu. neg. pattern.

ST silylation photoresist patterning dry etching; terpenoid acrylate polymer photoresist; alicyclic acrylate polymer photoresist; aliph acrylate polymer photoresist

IT Photoresists

(photoresist patterning contg. silylation process before dry development)

IT **202864-26-4P**, Glycidyl methacrylate-menthyl methacrylate copolymer

**202864-27-5P**, Allyl methacrylate-menthyl methacrylate copolymer

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)

(photoresist patterning contg. silylation process before dry development)

IT 999-97-3, Hexamethyldisilazane 101063-55-2, Cyclohexyl acrylate-glycidyl methacrylate copolymer 172920-09-1, Glycidyl methacrylate-isobornyl methacrylate copolymer 174952-10-4, Glycidyl methacrylate-menthyl acrylate copolymer 174952-23-9, Allyl methacrylate-menthyl acrylate copolymer 202864-28-6, Allyl methacrylate-cyclohexyl acrylate copolymer 202864-29-7, Adamantyl methacrylate-glycidyl methacrylate copolymer 202864-30-0, Adamantyl acrylate-allyl methacrylate copolymer

202864-31-1, Allyl methacrylate-isobornyl acrylate copolymer  
202864-32-2, Menthyl methacrylate-trifluoromethyl methacrylate copolymer  
202864-33-3, Menthyl methacrylate-trifluoromethyl acrylate copolymer  
202864-34-4, Cyclohexyl acrylate-trifluoromethyl methacrylate copolymer  
202864-35-5, Isobornyl methacrylate-trifluoromethyl methacrylate copolymer  
202864-36-6, Adamantyl acrylate-trifluoromethyl methacrylate copolymer

RL: TEM (Technical or engineered material use); USES (Uses)  
(photoresist patterning contg. silylation process before dry development)

IT 202864-26-4P, Glycidyl methacrylate-menthyl methacrylate copolymer  
202864-27-5P, Allyl methacrylate-menthyl methacrylate copolymer  
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(photoresist patterning contg. silylation process before dry development)

RN 202864-26-4 HCAPLUS

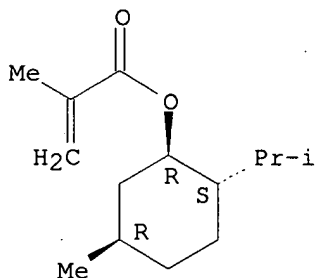
CN 2-Propenoic acid, 2-methyl-, 5-methyl-2-(1-methylethyl)cyclohexyl ester, (1.alpha.,2.beta.,5.alpha.)-, polymer with oxiranylmethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 7372-67-0

CMF C14 H24 O2

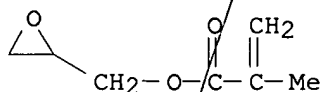
Relative stereochemistry.



CM 2

CRN 106-91-2

CMF C7 H10 O3



RN 202864-27-5 HCAPLUS

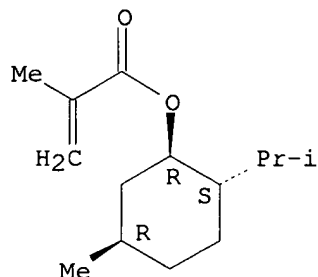
CN 2-Propenoic acid, 2-methyl-, 5-methyl-2-(1-methylethyl)cyclohexyl ester, (1.alpha.,2.beta.,5.alpha.)-, polymer with 2-propenyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1



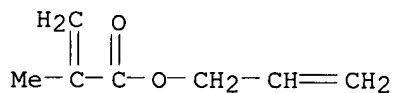
CRN 7372-67-0  
CMF C14 H24 O2

Relative stereochemistry.



CM 2

CRN 96-05-9  
CMF C7 H10 O2

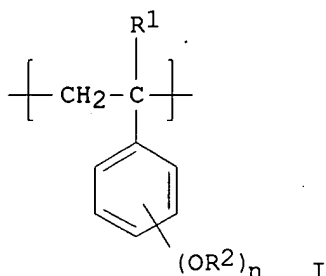


L44 ANSWER 37 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
AN 1997:168467 HCAPLUS  
DN 126:164258  
TI Polymer compounds and chemically amplified positive-type photoresists  
using the same providing heat-resistant resist patterns  
IN Watanabe, Osamu; Takeda, Yoshifumi; Tsucha, Junji; Ishihara, Toshinobu  
PA Shinetsu Chem Ind Co, Japan  
SO Jpn. Kokai Tokkyo Koho, 38 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
IC ICM C08F012-22  
ICS C08F220-06; G03F007-004; G03F007-039; H01L021-027  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
Reprographic Processes)  
Section cross-reference(s): 35

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08337616	A2	19961224	JP 1996-90203	19960319
	JP 3173368	B2	20010604		
	JP 2001206917	A2	20010731	JP 2000-389784	19960319
	US 5844057	A	19981201	US 1996-630633	19960411
	TW 487723	B	20020521	TW 1996-85104406	19960411
	US 6022665	A	20000208	US 1998-109084	19980702
PRAI	JP 1995-111189	A	19950412		
	JP 1996-90203	A3	19960319		
	US 1996-630633	A3	19960411		

GI



- AB The title polymers have the general formula I (R1 = H, Me; R2 = H, acid-labile group; at least one of R2 is H and acid labile group; n = 2, 3) of Mw 3000-300,000 and are used with org. solvents and acid generator and optionally phenolic dissoln. control agents for resists. A resist comprised 3,4-Me3COCO2(HO)C6H3CMe:CH2 polymer 80, p-Me3COC6H4S+Ph2 p-MeC6H4SO3- 3, and DGLM 300 parts.
- ST hydroxystyrene polymer photoresist; acid generator photoresist; dissoln control agent photoresist; amine additive photoresist; sulfonium compd acid generator
- IT Positive photoresists  
(polymer compds. and chem. amplified pos.-type photoresists using the same providing heat-resistant resist patterns)
- IT Amines, uses  
Bases, uses  
Sulfonium compounds  
RL: MOA (Modifier or additive use); USES (Uses)  
(polymer compds. and chem. amplified pos.-type photoresists using the same providing heat-resistant resist patterns)
- IT Acids, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(precursors; polymer compds. and chem. amplified pos.-type photoresists using the same providing heat-resistant resist patterns)
- IT 186768-70-7P 186768-72-9P 186768-74-1P 186768-76-3P 186768-78-5P  
186768-80-9P 186768-82-1P 186768-85-4P 186768-86-5P 186768-87-6P  
186768-88-7P 186768-89-8P 186768-90-1P 186768-91-2P 186768-93-4P  
186768-94-5P 186768-97-8P **186768-99-0P** 186769-00-6P  
186769-01-7P 186769-03-9P 186769-05-1P  
RL: **IMF (Industrial manufacture)**; PRP (Properties); TEM  
(Technical or engineered material use); **PREP (Preparation)**; USES  
(Uses)  
(polymer compds. and chem. amplified pos.-type **photoresists** using the same providing heat-resistant resist **patterns**)
- IT 56-41-7, Alanine, uses 62-53-3, Aniline, uses 95-84-1,  
2-Amino-p-cresol 102-71-6, uses 110-60-1, Tetramethylenediamine  
110-70-3, N,N'-Dimethylethylenediamine 110-89-4, Piperidine, uses  
120-73-0, Purine 127-19-5 142-08-5, 2-Hydroxypyridine 4458-32-6,  
Methylethylpropylamine 14159-45-6 34521-19-2, Pyridinesulfonic acid  
104105-16-0 117458-06-7 123589-22-0 125325-82-8 129674-22-2  
141573-11-7 145685-50-3 147625-42-1 151319-83-4D, 2-ethoxyethyl  
ethers 157089-24-2 158593-28-3 161453-44-7 162102-77-4  
168766-36-7D, tert-Bu ethers 170632-63-0 180801-55-2 186769-06-2  
186769-08-4 186769-10-8 186769-11-9 186769-12-0 186769-14-2

186811-04-1 186811-05-2D, tert-Bu carbonates 186811-06-3 186811-07-4  
186811-08-5 186912-09-4 186912-10-7

RL: MOA (Modifier or additive use); USES (Uses)  
(polymer compds. and chem. amplified pos.-type photoresists using the  
same providing heat-resistant resist patterns)

IT 186768-99-0P

RL: IMF (Industrial manufacture); PRP (Properties); TEM  
(Technical or engineered material use); PREP (Preparation); USES  
(Uses)

(polymer compds. and chem. amplified pos.-type photoresists  
using the same providing heat-resistant resist patterns)

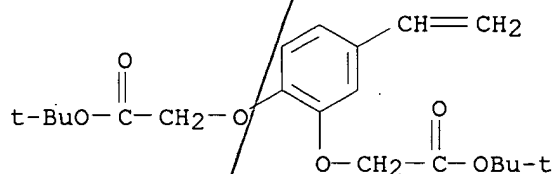
RN 186768-99-0 HCAPLUS

CN Acetic acid, 2,2'-[(4-ethenyl-1,2-phenylene)bis(oxy)]bis-,  
bis(1,1-dimethylethyl) ester, polymer with 4-ethenyl-1,2-benzenediol (9CI)  
(CA INDEX NAME)

CM 1

CRN 186768-98-9

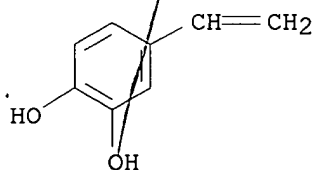
CMF C20 H28 O6



CM 2

CRN 6053-02-7

CMF C8 H8 O2



L44 ANSWER 38 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1997:14773 HCAPLUS

DN 126:60478

TI Vinyl monomers, polymers, and photoresist compositions and their use in  
pattern formation

IN Maeda, Katsumi; Nakano, Kaichiro; Oofuji, Takeshi; Hasegawa, Etsuo

PA Nippon Electric Co, Japan

SO Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08F020-26

ICS C08K005-00; C08L033-14; G03F007-004; G03F007-039; H01L021-027  
 CC 35-2 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 74

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08259626	A2	19961008	JP 1995-203150	19950809
	JP 2856116	B2	19990210		
	US 5665518	A	19970909	US 1996-588607	19960119
PRAI	JP 1995-11043		19950126		
	JP 1995-203150		19950809		
OS	MARPAT 126:60478				
AB	Polymers of the monomers CH <sub>2</sub> :CR <sub>1</sub> CO <sub>2</sub> XR <sub>2</sub> YCO <sub>2</sub> R <sub>3</sub> (R <sub>1</sub> is H, Me; R <sub>2</sub> is a C <sub>7</sub> -13 divalent cyclic hydrocarbon group; R <sub>3</sub> is H or an a group dissociated by acid; X is an alkylene group or a O-C bond-containing linking group; Y is an alkylene group or a C-C bond-containing linking group) have good transparency to far UV light, dry-etching properties, sensitivity, and resolution, and are useful in photoresists. A monomer was prepared by esterification of tricyclo[5.2.1.0 <sup>2,6</sup> ]decan-4,8-dimethanol and methacryloyl chloride followed by oxidation to the acid with pyridinium dichromate.				
ST	cyclic acrylic monomer photoresist polymer				
IT	Photoresists (vinyl monomers, polymers, and photoresist compounds and their use in pattern formation)				
IT	Monomers RL: IMF (Industrial manufacture); PREP (Preparation) (vinyl monomers, polymers, and photoresist compounds and their use in pattern formation)				
IT	184856-56-2P	184856-57-3P	184856-58-4P	184856-59-5P	184856-60-8P
	184856-61-9P	184856-62-0P	184856-63-1P		
	RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent) (monomer; vinyl monomers, polymers, and photoresist compounds and their use in pattern formation)				
IT	118496-49-4P RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent) (vinyl monomers, polymers, and photoresist compounds and their use in pattern formation)				
IT	184856-64-2P	184856-65-3P	184856-66-4P	184856-67-5P	184856-69-7P
		184892-14-6P			
	RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (vinyl monomers, polymers, and photoresist compounds and their use in pattern formation)				
IT	75-65-0, tert-Butyl alcohol	reactions	79-41-4, reactions	109-92-2	
	111-34-2, Butyl vinyl ether	814-68-6, Acryloyl chloride	920-46-7,		
	Methacryloyl chloride	20039-37-6	28132-01-6	154970-45-3	
	RL: RCT (Reactant); RACT (Reactant or reagent) (vinyl monomers, polymers, and photoresist compounds and their use in pattern formation)				
IT	184856-65-3P 184856-66-4P 184856-69-7P RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (vinyl monomers, polymers, and photoresist compounds and their use in pattern formation)				
RN	184856-65-3 HCAPLUS				
CN	4,7-Methano-1H-indenecarboxylic acid, octahydro[[2-methyl-1-oxo-2-				

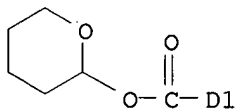
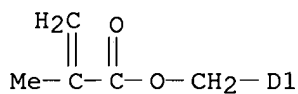
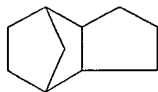
propenyl)oxy)methyl]-, polymer with tetrahydro-2H-pyran-2-yl  
octahydro[[ (2-methyl-1-oxo-2-propenyl)oxy)methyl]-4,7-methano-1H-  
indenecarboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 184856-58-4

CMF C21 H30 O5

CCI IDS

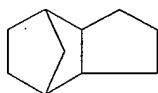


CM 2

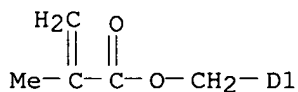
CRN 184856-56-2

CMF C16 H22 O4

CCI IDS



D1-CO<sub>2</sub>H



RN 184856-66-4 HCAPLUS

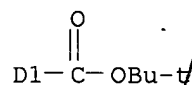
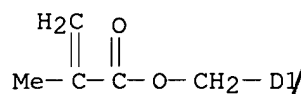
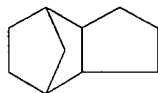
CN 4,7-Methano-1H-indenecarboxylic acid, octahydro[[ (2-methyl-1-oxo-2-propenyl)oxy)methyl]-, polymer with 1,1-dimethylethyl octahydro[[ (2-methyl-1-oxo-2-propenyl)oxy)methyl]-4,7-methano-1H-indenecarboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 184856-62-0

CMF C20 H30 O4

CCI IDS

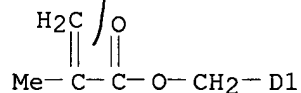
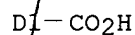


CM 2

CRN 184856-56-2

CMF C16 H22 O4

CCI IDS



RN 184856-69-7 HCAPLUS

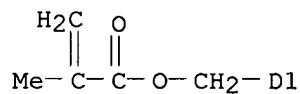
CN 4,7-Methano-1H-indenecarboxylic acid, octahydro[[ (2-methyl-1-oxo-2-propenyl)oxy]methyl]-, 1,1-dimethylethyl ester, polymer with [[ (2-methyl-1-oxo-2-propenyl)oxy]methyl]bicyclo[2.2.1]heptanecarboxylic acid (9CI) (CA INDEX NAME)

CM 1

CRN 184856-63-1

CMF C13 H18 O4

CCI IDS

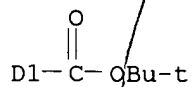
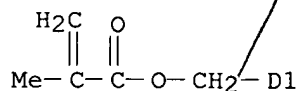
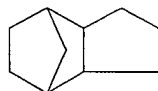
D1-CO<sub>2</sub>H

CM 2

CRN 184856-62-0

CMF C20 H30 O4

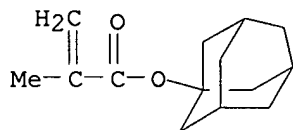
CCI IDS



L44 ANSWER 39 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN  
AN 1995:926275 HCAPLUS  
DN 123:316391  
TI Radiation-curable photoresist compositions for precision-lithographic patterning  
IN Takechi, Satoshi; Kodachi, Akiko  
PA Fujitsu Ltd, Japan  
SO Jpn. Kokai Tokkyo Koho, 6 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
IC ICM C08F220-20  
ICS H01L021-027  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 74

FAN.CNT 1

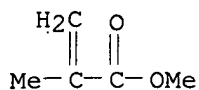
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07196743	A2	19950801	JP 1993-338112	19931228
PRAI	JP 1993-338112		19931228		
AB	The title compns. useful for forming patterns on elec. circuit boards, etc., are formulated from (optionally methyl-substituted) adamantyl methacrylate and vinyl monomers having electron withdrawing group on .alpha.-position, e.g. Me .alpha.-chloroacrylate. Heating a 0.5 mol/L soln. of a 2:1 mixt. of adamantyl methacrylate and Me .alpha.-chloroacrylate in 1,4-dioxane contg. AIBN at 80.degree. for 8 h gave a copolymer which could be pptd. by MeOH and solubilized in cyclohexanone to give a photoresist curable by electron beam.				
ST	radiation curing photoresist lithog patterning; adamantyl methacrylate chloroacrylate copolymer photoresist; electron beam curing photoresist lithog				
IT	Electron beam (for curing photoresist compns. for precision-lithog. patterning)				
IT	Resists (photo-, radiation-curable photoresist compns. for precision-lithog. patterning)				
IT	Electric circuits (printed, boards, radiation-curable photoresist compns. for precision-lithog. patterning)				
IT	128509-51-3P 170445-44-0P 170445-45-1P 170445-46-2P 170445-47-3P RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (radiation-curable <b>photoresist</b> compns. for precision-lithog. patterning)				
IT	128509-51-3P 170445-44-0P 170445-46-2P RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (radiation-curable <b>photoresist</b> compns. for precision-lithog. patterning)				
RN	128509-51-3 HCAPLUS				
CN	2-Propenoic acid, 2-methyl-, methyl ester, polymer with tricyclo[3.3.1.1 <sup>3,7</sup> ]dec-1-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)				
CM	1				
CRN	16887-36-8				
CMF	C14 H20 O2				



CM 2

CRN 80-62-6  
CMF C5 H8 O2





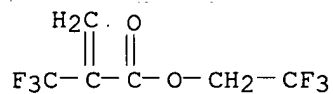
RN 170445-44-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 3,5-dimethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-1-yl ester, polymer with 2,2,2-trifluoroethyl 2-(trifluoromethyl)-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 91520-39-7

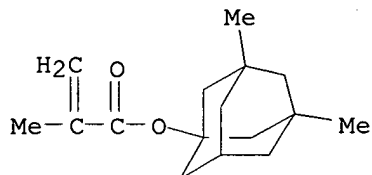
CMF C6 H4 F6 O2



CM 2

CRN 23743-73-9

CMF C16 H24 O2



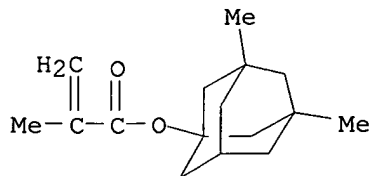
RN 170445-46-2 HCAPLUS

CN 2-Propenoic acid, 2-chloro-, methyl ester, polymer with 3,5-dimethyltricyclo[3.3.1.1<sup>3,7</sup>]dec-1-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 23743-73-9

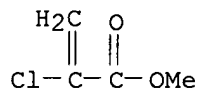
CMF C16 H24 O2



CM 2

CRN 80-63-7

CMF C4 H5 Cl O2



L44 ANSWER 40 OF 40 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1995:695949 HCAPLUS

DN 123:97947

TI Photoresist composition suitable for KrF excimer laser and patterning

IN Kodachi, Akiko; Takechi, Satoshi

PA Fujitsu Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G03F007-039

ICS G03F007-004; G03F007-075; H01L021-027; H01L021-312

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07036188	A2	19950207	JP 1993-178903	19930720
	JP 3316601	B2	20020819		
	JP 2002196498	A2	20020712	JP 2001-368472	19930720
PRAI	JP 1993-178903	A3	19930720		
AB	The title compn. comprises a resin represented by (R1C:CR2) (R1 = H, alkyl, Ph, halo, halogenated alkyl, halogenated Ph; R1 may contain Si; R2 = .gtoreq.1 Si-contg. alkyl, Ph, halogenated alkyl, halogenated Ph, alkoxy) and an acid-generating agent upon irradiation of light. Preferably, R2 = Si(Me)3 or Si(Me)3CH2Si(Me)3. The title patterning comprises developing with an alkali soln.				
ST	photoresist compn krypton fluoride laser; patterning photoresist alkali developer				
IT	Quaternary ammonium compounds, uses				
	RL: TEM (Technical or engineered material use); USES (Uses)				
	(photoresist compn. suitable for KrF excimer laser and patterning)				
IT	Resists				
	(photo-, resins and acid-generators)				
IT	165249-76-3P 165249-78-5P 165249-79-6P				
	RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)				
	(photoresist compn. suitable for KrF excimer laser and patterning)				
IT	57840-38-7, Triphenylsulfoniumhexafluoroantimonate 95511-75-4				
	RL: TEM (Technical or engineered material use); USES (Uses)				
	(photoresist compn. suitable for KrF excimer laser and patterning)				
IT	165249-78-5P 165249-79-6P				
	RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)				
	(photoresist compn. suitable for KrF excimer laser and patterning)				

**patterning)**

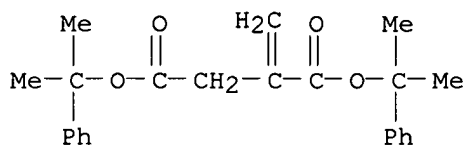
RN 165249-78-5 HCAPLUS

CN Butanedioic acid, methylene-, bis(1-methyl-1-phenylethyl) ester, polymer with bis[(trimethylsilyl)methyl] methylenebutanedioate (9CI) (CA INDEX NAME)

CM 1

CRN 165249-77-4

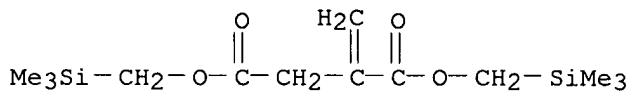
CMF C23 H26 O4



CM 2

CRN 24544-99-8

CMF C13 H26 O4 Si2



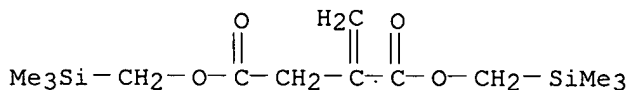
RN 165249-79-6 HCAPLUS

CN Butanedioic acid, methylene-, bis(1,1-dimethylethyl) ester, polymer with bis[(trimethylsilyl)methyl] methylenebutanedioate (9CI) (CA INDEX NAME)

CM 1

CRN 24544-99-8

CMF C13 H26 O4 Si2



CM 2

CRN 7398-94-9

CMF C13 H22 O4

